EXHIBIT A

```
                          RECEIPT FOR PAYMENT
                          ===================


  Fulton County Prothonotary                    Receipt Date  9/22/2022
    201 North Second Street                      Receipt Time  11:28:02
  McConnellsburg, PA  17233                      Receipt No.      131115
       Phone: (717) 485-4212

        RECEIPT FOR MISCELLANEOUS INCOME
  - - -                                                              - - -
      Case Number    2022-99999

      Received of:   COPIES 292 PGS NO 232 OF 2022
                     C

  ---------------------- Transaction Distribution -----------------------
  Cost/Fee Description      Payment Amount     Payee Name
  MISC. MONIES                      146.00     TREASURER OF FULTON COUNTY
                            ----------------
                                  $146.00


  Cash                              $146.00
                            ----------------
  Total Received.........           $146.00
```

Supreme Court of Pennsylvania

Court of Common Pleas
Civil Cover Sheet

_____Fulton_____ County

For Prothonotary Use Only:

Docket No:
232-2022 C

FULTON COUNTY
PENNSYLVANIA
FILED

SEP 21 2022

PROTHONOTARY, CLERK OF COURTS,
CLERK OF ORPHANS COURT,
REGISTER OF WILLS, RECORDER OF DEED

The information collected on this form is used solely for court administration purposes. This form does not supplement or replace the filing and service of pleadings or other papers as required by law or rules of court.

SECTION A

Commencement of Action:
- [X] Complaint
- [ ] Writ of Summons
- [ ] Transfer from Another Jurisdiction
- [ ] Petition
- [ ] Declaration of Taking

Lead Plaintiff's Name:

Lead Defendant's Name:

Are money damages requested? [X] Yes [ ] No

Dollar Amount Requested:
(check one)
- [ ] within arbitration limits
- [X] outside arbitration limits

Is this a _Class Action Suit?_ [ ] Yes [X] No

Is this an _MDJ Appeal?_ [ ] Yes [X] No

Name of Plaintiff/Appellant's Attorney: Thomas J Carroll, Esquire

- [ ] Check here if you have no attorney (are a Self-Represented [Pro Se] Litigant)

SECTION B

Nature of the Case: Place an "X" to the left of the **ONE** case category that most accurately describes your **PRIMARY CASE.** If you are making more than one type of claim, check the one that you consider most important.

TORT (do not include Mass Tort)
- [ ] Intentional
- [ ] Malicious Prosecution
- [ ] Motor Vehicle
- [ ] Nuisance
- [ ] Premises Liability
- [ ] Product Liability (does not include mass tort)
- [ ] Slander/Libel/ Defamation
- [ ] Other:
_____
_____

MASS TORT
- [ ] Asbestos
- [ ] Tobacco
- [ ] Toxic Tort - DES
- [ ] Toxic Tort - Implant
- [ ] Toxic Waste
- [ ] Other:
_____
_____

PROFESSIONAL LIABLITY
- [ ] Dental
- [ ] Legal
- [ ] Medical
- [ ] Other Professional:
_____
_____

CONTRACT (do not include Judgments)
- [ ] Buyer Plaintiff
- [ ] Debt Collection: Credit Card
- [ ] Debt Collection: Other
_____
_____
- [ ] Employment Dispute: Discrimination
- [ ] Employment Dispute: Other
_____
_____
- [X] Other:
Breach of Contract
_____
_____

REAL PROPERTY
- [ ] Ejectment
- [ ] Eminent Domain/Condemnation
- [ ] Ground Rent
- [ ] Landlord/Tenant Dispute
- [ ] Mortgage Foreclosure: Residential
- [ ] Mortgage Foreclosure: Commercial
- [ ] Partition
- [ ] Quiet Title
- [ ] Other:
_____

CIVIL APPEALS
Administrative Agencies
- [ ] Board of Assessment
- [ ] Board of Elections
- [ ] Dept. of Transportation
- [ ] Statutory Appeal: Other
_____
_____
- [ ] Zoning Board
- [ ] Other:
_____
_____

MISCELLANEOUS
- [ ] Common Law/Statutory Arbitration
- [ ] Declaratory Judgment
- [ ] Mandamus
- [ ] Non-Domestic Relations Restraining Order
- [ ] Quo Warranto
- [ ] Replevin
- [ ] Other:
_____
_____

Updated 1/1/2011

LAW OFFICE OF THOMAS J CARROLL
Attorney for Plaintiffs
Attorney ID: 53296
Thomas J. Carroll
224 King Street
Pottstown, PA, 19464
tom@thomasjcarrolllaw.com
(610)419-6981

> FULTON COUNTY
> PENNSYLVANIA
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> REGISTER OF WILLS, RECORDER OF DEEDS
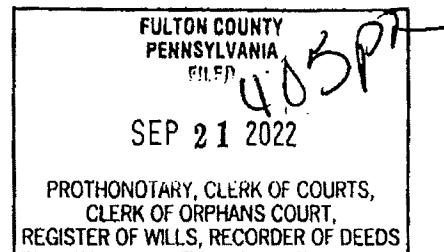
IN THE 39TH JUDICIAL DISTRICT
COURT OF COMMON PLEAS
FOR FULTON COUNTY, PENNSYLVANIA

COUNTY OF FULTON, FULTON COUNTY BOARD OF ELECTIONS, AND STUART L. ULSH, IN HIS OFFICIAL CAPACITY AS COUNTY COMMISSIONER OF FULTON COUNTY AND IN HIS CAPACITY AS A RESIDENT, TAXPAYER AND ELECTOR IN FULTON COUNTY, AND RANDY H. BUNCH, IN HIS OFFICIAL CAPACITY AS COUNTY COMMISSIONER OF FULTON COUNTY AND IN HIS CAPACITY AS A RESIDENT, TAXPAYER AND ELECTOR OF FULTON COUNTY, Plaintiffs, v. DOMINION VOTING SYSTEMS, INC. and U.S. DOMINION, INC., Defendants.	Case No. 232-2022 September 2022 CIVIL LAW COMPLAINT JURY TRIAL DEMANDED NOTICE TO DEFENDANTS You have twenty (20) days to respond to the Complaint presented herein, or a judgment may be entered against you. _____ Attorney for Plaintiffs Assigned to Judge Angela R. Krom

NOTICE

You have been sued in court. If you wish to defend against the claims set forth in the following pages, you must take action within twenty (20) days after this complaint and notice are served, by entering a written appearance personally or by attorney, and filing in writing with the court your defenses or objections to the claims set forth against you. You are warned that if you fail to do so the case may proceed without you and a judgment may be entered against you by the court without further notice for any money claimed in the complaint or for any other claim or relief requested by the plaintiff. You may lose money or property or other rights important to you.

YOU SHOULD TAKE THIS PAPER TO YOUR LAWYER AT ONCE, IF YOU DO NOT HAVE A LAWYER OR CANNOT AFFORD ONE, GO TO OR TELEPHONE THE OFFICE SET FORTH BELOW TO FIND OUT WHERE YOU CAN GET LEGAL HELP.

Pennsylvania Lawyer Referral Service
Pennsylvania Bar Association
100 South Street, P.O. Box 186
Harrisburg, PA 17108
(800) 692-7375

2

COMPLAINT AND JURY DEMAND

Now comes Plaintiff, Fulton County, Pennsylvania, by and through its attorneys, and for their Complaint states as follows.

PARTIES

1.   Plaintiff, Fulton County, Pennsylvania ("Fulton County") Board of Elections, is the governmental agency and representative of the citizens of Fulton County, Pennsylvania, and all municipalities and precincts located within its boundaries with respect to the conducting of elections within Fulton County.

2.   Fulton County's headquarters are located at 116 W. Market Street, Suite 203, McConnellburg, Pennsylvania, 17233.

3.   Upon information and belief, Defendant, Dominion Voting Systems, Inc. ("Dominion"), is a Delaware corporation with its principal place of business in Colorado, at 1201, 18th Street, Suite 210, Denver, CO, 80202. Dominion Voting Systems Corporation is an Ontario corporation with its principal place of business in Ontario, Canada. Dominion Voting Systems, Inc. and Dominion Voting Systems Corporation are wholly owned subsidiaries of US Dominion, Inc., which is also a Delaware Corporation, which also has or had its principal place of business at 1201, 18th Street, Suite 210, Denver, CO, 80202.

JURISDICTION AND VENUE

1.   Fulton County is first party to a contract (a "Voting System and Managed Services Agreement", hereafter "Agreement") with Dominion, which

Agreement was executed for and within Fulton County, Pennsylvania, on or about

August 20, 2019, for equipment and services to be provided to Fulton County.

(**EXHIBIT A-1 through A-34**).[1]

2.   Defendant, Dominion Voting Systems, Inc., is second party to the

Agreement with Fulton County, which Agreement, on information and belief,

was signed and executed by Dominion on or about August 14, 2019. (**EXHIBIT**

A-11).

3.   Both parties to this lawsuit live, reside in, or do business in Fulton

County in the State of Pennsylvania.

4.   Therefore, jurisdiction in this Court is proper.

5.   Venue is proper in the county or counties in which the act or

occurrence that is the subject of this complaint took place.

6.   Therefore, venue in this Court is proper.

7.   The Agreement provides that its "[i]nterpretation of this Agreement

shall be governed by the laws the Customer's State [Pennsylvania], and the courts

of competent jurisdiction located in the Customer's State [Pennsylvania] will

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[1] **EXHIBIT A** to this Complaint consists of the Managed Services Agreement entered into by and between Fulton County and Dominion on or about August 20, 2019, and the attachments to that Agreement (Exhibits A and B); a Revision (Amendment 1) entered into on or about September 15, 2019; and a subsequent revision (Amendment 2), entered into on or about February 15, 2020. This exhibit in its entirely, is identified for ease of reference in this Complaint by an added footer: **FULTON COUNTY V. DOMINION, EXHIBIT A-1**, et seq.

have jurisdiction to hear and determine questions related to this Agreement." (**EXHIBIT A-9**).

GENERAL ALLEGATIONS

8.   In 2019, Fulton County sought to purchase voting system services and software for the running of its elections.

9.   On information and belief, Dominion held itself out as an entity that "designs, manufactures, licenses, and provides services for its voting systems." (**EXHIBIT A-1**)

10.   Fulton County thereafter entered in the Agreement with Dominion for the latter to provide "voting system services, software licenses and related services" to Fulton County for the conducting of elections held within Fulton County. *Id.*

11.   The Agreement was signed by Fulton County on or about August 20, 2019 and expires on December 31, 2026. (**EXHIBIT A-11; EXHIBIT A-2**)

12.   In the agreement, Fulton County is referred to as the "Customer". (**EXHIBIT A-1**).

13.   On information and belief, the initial agreement contained two exhibits (Exhibits A and B), which are described therein as a "Pricing / Payment Summary and Deliverable Description" and "Software License Terms and Conditions," respectively. *Id.*

14.   The Agreement contained several terms and conditions upon which the performance of the Agreement by Dominion was based.

15.   The Agreement defined the term "Acceptance," as applied to and by Fulton County in terms that were entirely dependent upon events and occurrences dictated by and controlled by Dominion.

16.   According to the Agreement, the term "Acceptance" was defined, in pertinent part, as

> "...successful completion by the Customer of the acceptance testing performed on each component of Dominion Hardware and Software, after delivery in accordance with testing criteria *developed and agreed to by the parties, or the occurrence of other events defined in Section 8.*" **EXHIBIT A-1** (emphasis supplied).

17.   Section 8 of the Agreement further explained that such "testing" would only be conducted via "criteria *developed, updated,* and *delivered* to Customer...*by Dominion.*" **EXHIBIT A-4,** ¶ 8.1 (emphasis added).

18.   The Agreement's requirement that Fulton County accept Dominion's "testing," contained a further condition that Fulton County agree to have this testing performed no later than 10 days after installation. *Id.*

19.   The Agreement goes on to state that any other testing "to the extent not tested as part of the testing pursuant to Subsection 8.1" would also be conducted according to "the Acceptance test procedures developed and updated...*by Dominion.*" **EXHIBIT A-4 and A-5,** ¶ 8.2 (emphasis added).

6

20.   Further to this onerous, indeed, unilaterally imposed condition, Dominion gave Fulton County only 5 days to notify Dominion in writing if this *testing* of the Dominion Hardware, or the System did not "conform to user documentation *or Dominion provided Acceptance criteria....*" **EXHIBIT A-5,** ¶ 8.3 (emphasis added).

21.   A final paragraph in this "Section 8" further onerously and unilaterally provides that regardless of whether "the System, in whole or in part...*fails to conform with the specifications, requirements and functions set out in the Agreement* in a manner that does not affect the performance of the System," Fulton County "*will not refuse to grant Acceptance* of the System". *Id.,* ¶ 8.4 (emphasis added).

22.   Another section of the Agreement requires Fulton County to conduct acceptance testing "as required by Section 8." **EXHIBIT A-3,** ¶ 5.3.

23.   The Agreement defines "System" to include a combination of Dominion and non-Dominion components and integral parts, including, "the combination of Dominion Software, Dominion Hardware and EMS Hardware." **EXHIBIT A-2,** ¶ 2.8.

24.   Non-Dominion component or integral parts of the "System" include "Election Management System Hardware" or "EMS Hardware" defined further by the Agreement as "third party hardware required for operating Dominion Software as used in conjunction with the Dominion Hardware." *Id.,* ¶ 2.6.

7

25.   The Agreement contains an additional reference to "non-dominion" components or integral parts of the "System" not encompassed within the meaning of the Dominion System as defined, including, "Third Party Software," which means *"manufacturer supplied software, or firmware owned by third parties,* which Dominion provides to Customer pursuant to sublicenses or end user license agreements with the owners of such Third Party Software, Third Party Software *includes, but is not limited to, various operating systems, software drivers, report writing subroutines, and firmware."* **EXHIBIT A-2, ¶ 2.9** (emphasis added).

26.   With respect to such "Third Party Software," the Agreement contained a unilateral, no-choice, trigger provision that constituted "acceptance" of the "terms and conditions" of such Third Party Software "imposed by the owners of such Third Party Software" wherein Fulton County is said to have consented to the terms and conditions of the third party License Agreements "by Customer's first use of the System." **EXHIBIT A-4, ¶ 7.2.**

27.   Fulton County is not and never has been in privity with, and has not signed or become a party to, any agreement, license, or other convention, by or with any owner of any third-party software or third-party hardware used in the Dominion System.

28.   The Agreement also contains a "Title and Risk of Loss" Section, Section 6, wherein it is provided that "[t]he System shall be provided by Dominion to the Customer as part of the managed services described herein" and

that "[t]itle to the System or any portion thereof, shall not pass to the Customer and shall remain with Dominion." **EXHIBIT A-4**, ¶ 6.1.

29.   The Agreement further provides that "Dominion Software and Third Party Software is licensed, not sold" and "[t]he original and any copies of the Dominion Software, or other software provided pursuant to this agreement, in whole or in part, including any subsequent improvements or updates, shall remain the property of Dominion, or any third party that owns such software." *Id.*, ¶ 6.2.

30.   The Agreement contains a "warranties" section, Section 9, which lays out several ostensible terms and conditions respecting warranties of Dominion and non-Dominion components or integral parts of the Dominion System. **EXHIBIT A-5**.

31.   The Agreement states that the Dominion Software warranty is also subject to terms and conditions in an attached exhibit "B". *Id.*, ¶ 9.1.

32.   The Agreement provides that "[t]he warranties in this Sections[sic] 9 do not apply to any third party products". **EXHIBIT A-5**, ¶ 9.2.

33.   Paragraph 9.2 further provides: "However, to the extent permitted by the manufacturers of third party products, Dominion shall pass through to Customer all warranties such manufacturers make to Dominion regarding the operation of third party products." *Id.*

34.   In the Agreement, "Dominion warrants that when used with the hardware and software configuration purchased through or approved by Dominion, each component of Dominion Hardware will be free of defects that

would prevent the Dominion Hardware from operating in conformity in all material respects with its specifications as documented by Dominion. The Dominion Hardware Warranty shall remain in effect during the Agreement Term." *Id.*, ¶ 9.3.

35.   The Agreement purports to contain a "disclaimer" of warranty, which provides:

> DOMINION DISCLAIMS ALL OTHER WARRANTIES, AND REPRESENTATIONS, WHETHER WRITTEN, ORAL, EXPRESS, OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE AND ANY WARRANTY BASED ON A COURSE OF DEALING, COURSE OF PERFORMANCE OR USAGE OF TRADE. [**EXHIBIT A-6,** ¶ 9.5.]

36.   The Agreement also contains a "Limitation of Liability" provision, which purports to limit Dominion's liability to 200 percent of the cost of the contract, but explicitly exempts "damages caused by Dominion's gross negligence or willful misconduct" from such limitation. **EXHIBIT A-6,** ¶ 12.

37.   Exhibit B to the Agreement (**EXHIBIT A-17 to A-20**), which further provides and defines certain information and warranties respecting Dominion Systems, including Dominion Software and other "Third-Party Products", which the Agreement defines as "any software or hardware obtained from third-party manufacturers or distributers and provided by Licensor [Dominion Voting Systems, Inc.] hereunder." **EXHIBIT A-17,** ¶ 1.6.

38.   Fulton County is not and never has been in privity with, and has not signed or become a party to, any agreement, license, or other convention, by or with any owner of any third-party software or third-party hardware used in the Dominion System, including any manufacturer or distributer of "Third-Party Products" as defined in the Agreement.

39.   In the Agreement, "Dominion warrants that when used with the hardware and software configuration purchased through or approved by Dominion, each component of Dominion Hardware will be *free of defects that would prevent the Dominion Hardware from operating in conformity in all material respects with its specifications as documented by Dominion.* The Dominion Hardware Warranty shall remain in effect during the Agreement Term." **EXHIBIT A-5,** ¶ 9.3 (emphasis added).

40.   The Agreement further warrants that "the Software will function substantially in accordance with the Specifications during the Term". **EXHIBIT A-19,** ¶ 7.1.

41.   In January and February of 2019, a certification report was created concerning the Dominion voting systems (Democracy Suite 5.5A with ImageCast Ballot Marking Device (ICX-BMD)), inter alia. (**EXHIBIT B**, Certification Report Concerning Examination Results for Dominion Democracy Suite 5.5A with ImageCast Ballot Marking Device (ICX-BMD), ImageCast Precinct Optical Scanner (ICP), ImageCast Central Station (ICC), and Democracy Suite EMS (EMS) (Dominion Certification Report)).

42. The Dominion Certification Report contains a Section IV entitled Conditions for Certification. *Id.*, pp. 40-50.

43. These conditions for certification were required to be met before the voting system could be implemented. *Id.*, p. 52.

44. The conditions included a required "final EAC certification" to be performed and approved after the initial certification, which was done in December 2018. *Id.*, p. 40, ¶ A.

45. The Dominion Certification Report provides that "[n]o components of any of the Democracy Suite 5.5A shall be connected to any modem or network interface, including the Internet, at any time, except when a standalone local area wired network configuration in which all connected devices are certified voting system components…. Any wireless access points in the district components of Democracy Suite 5.5A, including wireless LAN cards, network adapters, etc. must be uninstalled or disabled prior to delivery or upon delivery of the voting equipment to a county board of elections." *Id.*, ¶ C.

46. On or after November 2020, Fulton County became aware of severe anomalies in the Dominion Voting Systems due to the inaccuracy and/or inability to reconcile voter data with votes actually cast and counted, i.e., tabulated, by the System in Fulton County.

47. On or after November 2020, Fulton County became aware of certain factors and aspects of the Dominion Voting Systems that did not meet the

"conditions" for certification set forth in the January 2019 / February 2019 certification report (**EXHIBIT B**).

48.   Fulton County subsequently sought additional information pertaining to the hardware, software, and integral components and parts, of the Dominion System used in conducting its elections.

49.   In addition, Fulton County was informed of additional anomalies and problems in Dominion's "voting" systems via an expert report written by J. Alex Halderman in July 2021. (**EXHIBIT C**, the Halderman Declaration, September 21, 2021).

50.   In his declaration, Halderman described numerous security vulnerabilities in Dominion's ICX software, including flaws that would allow attackers to install malicious software on the ICX, either with temporary or physical access (such as that of voters in polling places) or remotely from election management systems. **EXHIBIT C**, p. 1, ¶ 2.

51.   In other words, the Halderman Declaration describes that the Dominion Voting System used by Fulton County and purportedly tentatively certified in January of 2019 was vulnerable to remote internet access and did not in fact meet the Dominion Certification Report conditions as guaranteed and as warranted by Dominion, see **EXHIBIT B**, p. 40, ¶ C.

52.   At the time of that report, the author described that these vulnerabilities still existed, and could be mitigated, but that such mitigation would "take months for Dominion to assess the problems, develop responsive software

13

updates, test them, obtain any necessary approvals from the EAC and state-level certification authorities, and distribute the new software...." **EXHIBIT C**, p. 3, ¶ 3.

53.   The author further concluded that the ICX is likely to contain other, equally critical flaws, which are yet to be discovered, and that while jurisdictions might mitigate this, "[e]lection officials cannot make an informed decision about such urgent policy changes or any other mitigations until they have assessed the technical findings" in the report. *Id.*, p. 3, ¶ 4.

54.   The report also notes that the ICX is set to be used in 2022 in at least parts of 16 states, including Pennsylvania, with these vulnerabilities and faults still in place.

55.   After determining that Dominion had not provided a product or a system as guaranteed and as warranted, and that fulfilled the requirements of a voting system that ensured integrity, safety, security, and accuracy in the conduction of elections and the tabulation of votes thereafter, Fulton County undertook actions to determine what remedy or remedies it might have to protect its own contractual rights and to ensure the integrity of elections so that the rights of Fulton County Citizens would not be infringed upon or otherwise compromised.

56.   Wake TSI conducted a report on February 19, 2021. (**EXHIBIT D**).

57.   Importantly, that report found, inter alia, as follows;

   a. There were errors in the ballot scanning;

b. There was a failure of Dominion Voting to meet Commonwealth Certification requirements;

c. There were non-certified database tools installed on the Dominion Voting System;

d. There were changes made to EMS three weeks before the 2020 election; and

e. There was a lack of commonwealth L&A inspections of the Dominion Voting Systems. *Id.*, p. 5.

58.   As the Wake TSI Report pointed out, the Commonwealth required the Pennsylvania Department of State (DOS) to perform and collect the L&A testing results. *Id.*

59.   In mid-2021, the Secretary of the Commonwealth subsequently "decertified" the Dominion Voting System machines in Fulton County, purportedly because Fulton County had used "a third-party consultant" to inspect its electronic voting devices as part of Fulton County's inquiry into the integrity of the system's performance during the 2020 election.

60.   On or about August 18, 2021, Fulton County sued the Secretary of the Commonwealth challenging the Secretary's decertification of Dominion's voting machines. Case No. 277 MD 2021.

61.   Fulton County filed an amended petition on September 17, 2021.

62.   Fulton County's lawsuit contained five counts: (1) the Secretary unlawfully decertified Fulton County's two electronic voting machines; (2) the Pennsylvania Election Code (Election Code) expressly authorized the County to inspect its electronic voting devices as part of its statutory duty to ensure the safe

15

and honest conduct of elections in the County; (3) a directive of the Secretary, which purported to prohibit all county boards of elections from inspecting their electronic voting devices with the assistance of a third-party consultant, violated Section 302 of the Election Code, 25 P.S. §2642; (4) the Secretary unlawfully withheld funding from the County that it needs to acquire replacement electronic voting devices; and (5) a request for injunctive relief to restore the status quo that existed prior to the Secretary's unlawful decertification of the county's voting machines.

63.   On or about January 1, 2022, Fulton County subsequently stopped using Dominion Voting Systems and contracted with another provider.

64.   On or about January 3, 2022, Dominion sought to "intervene", claiming that it was intervening *"for the limited purpose of securing a protective order to enforce the terms of its contract"* with Fulton County.

65.   Dominion did not file a counter-claim or cross-claim, or otherwise file any affirmative pleadings in these proceedings containing legal claims as against any other party.

66.   Further after it stopped using Dominion, and further to its due diligence in protecting its contractual and legal rights and that of its citizens, on September 15, 2022, a commissioned report revealed several deficiencies and the absence of information and data that directly implicated and contradicted the contractual terms, conditions, promises, and warranties provided to Fulton County by Dominion in the Agreement and the conditions required for

16

certification in the Dominion Certification Report. (**EXHIBIT E**, Speckin Forensics, LLC, September 2022 Report).

67.   The September Report reveals the results of analysis performed on six hard drives in Fulton County, which images were created in July 2022. (*Id.*, p. 1).

68.   The September Report revealed that contrary to the terms of the Agreement, "security measures necessary to harden and secure" the Dominion machines was not completed; showing the last update or security patch to have been performed in April 2019. *Id.*, p. 1.

69.   The September Report showed that external USB hard drives had been inserted in the machines on several occasions, and that there is no known list of approved external drives that could have been or were used or inserted into the machines. *Id.*, p. 2, ¶ 2. In this regard, the report concluded that there was no way to determine whether and to what extent these unauthorized drives compromised the data or the system. *Id.*

70.   The September Report further concluded that there had been "substantial changes" to the drives as seen with the inclusion of over 900 .dll files and links created since the date of installation of the Dominion software and these pathways constituted a security breach due to the introduction of an unauthorized "script" into the Dominion voting systems used in Fulton County. *Id.*, ¶ 3.

71.   The September Report found that a "python script" had been installed *after the certification date* of the system" and not only should such a script not have been added to the system, but "[t]his python script can exploit and create

17

any number of vulnerabilities including, external access to the system, data export of the tabulations, or introduction of other metrics not part of or allowed by the certification process." *Id.*, ¶ 5. Among other findings, this constituted a direct violation of and failure of the conditions required for certification in the Dominion Certification Report, see **EXHIBIT B**, pp. 40-50.

72.   Each of the drives are "interconnected in a system to one another" and that this would be required to share data and counts between devices. *Id.*, ¶ 6. However, "[b]ecause of this networking, unauthorized access [to] any one device, allowed unauthorized access to any device connected to the network of devices." *Id.* Among other findings, this constituted a direct violation of and failure of the conditions required for certification in the Dominion Certification Report, see **EXHIBIT B**, pp. 40-50, ¶ C.

73.   The September Report further determined that "[a]n external IP address that is associated with Canada is found on the Adjudication01 [workstation]" and "[t]his shows that at least one of the network devices has connected to an external device on an external network" and that this was the same device that the post-certification python script was found on. *Id.*, ¶ 7. Among other findings, this constituted a direct violation of and failure of the conditions required for certification in the Dominion Certification Report, see **EXHIBIT B**, pp. 40-50, ¶ C.

74.   The log files for the Adjudication device showed an IP address of 172.102.16.22, which derives from a location in Quebec, Canada and that this

18

revealed a serious issue to be connected remotely to a Canadian system. *Id.* at p. 4. The report cannot determine when this connection occurred nor what data was transmitted, but this remote access did occur. *Id.* Among other findings, this constituted a direct violation of and failure of the conditions required for certification in the Dominion Certification Report, see **EXHIBIT B**, pp. 40-50, ¶ C.

75.   The machines and devices only had Windows Defender dating to July 2016 and that no other updates had been made. *Id.*, p. 3. The report concluded that "viruses or malicious software" created after that date would not be combated by the systems without proper updates. *Id.* Among other findings, this constituted a direct violation of and failure of the conditions required for certification in the Dominion Certification Report, see **EXHIBIT B**, pp. 40-50.

76.   The September Report findings confirmed that many of the "conditions" in the certification report which were required to be met for certification were not met and were not present before, during and after the November 2020 election and up to the present. Among other findings, this constituted a direct violation of and failure of the conditions required for certification in the Dominion Certification Report, see **EXHIBIT B**, pp. 40-50.

77.   In addition to the facts alleged herein, to wit, that Dominion Voting Systems products did not function correctly, had faults and defects, and did not meet conditions required during and after the November 2020 election in Fulton County, and in addition to the aforementioned analyses, described herein, Fulton

County has become aware of additional information demonstrating the existence of anomalies, defects, and faults in the Dominion Voting Systems products before, during and after the November 2020 election.

78.   On March 31, 2022, the United States Election Assistance Commission (EAC) conducted an investigation and issued a report (the EAC Report). (**EXHIBIT F**, EAC Report of Investigation, March 31, 2022).

79.   The EAC Report concerned an investigation performed on Dominion Voting Systems used during a municipal election held in October 2021 in Williamson County, Tennessee. *Id.*, p. 2.

80.   The EAC Report concluded that 7 out of a total of 18 image cast precinct (ICP) tabulators used during the election "did not match the number of ballots scanned." *Id.* This anomaly was confirmed and reproduced during investigation, but "the root cause of the anomaly was not determined." *Id.*, p. 3.

81.   The EAC Report further discovered that the Dominion Voting System "was installed with outdated versions of two configuration files when the system was upgraded...." *Id.*, p. 3.

82.   The EAC Report noted that "[b]allots were printed from the ICX and tabulated through the ICP scanners. Multiple ICP scanners were used for tabulation including some that originally exhibited the anomaly during the election and some that did not. Following tabulation, close poll reports and audit logs from the ICP scanners were examined. Results showed that the anomaly *was recreated on each of the ICP scanners*. This process was repeated several

20

times to understand and isolate the details of exactly when the anomaly occurred and circumstances that may have led to the anomaly occurring." *Id.*

83. The EAC Report further concluded that "[a]nalysis of audit log information revealed entries that coincided with the manifestation of the 'anomaly; a security error 'QR code signature mismatch' and a warning message 'Ballot format or id is unrecognizable' indicating a QR code misread occurred. When these events were logged, the ballot was rejected. Subsequent resetting of the ICP scanners and additional tabulation demonstrated that each instance of the anomaly coincided with the previously mentioned audit log entries, though not every instance of those audit log entries resulted in the anomaly." *Id.*

84. The EAC Report concluded that once the anomaly was triggered, "ballots successfully scanned and tabulated by the ICP were not reflected in the close poll reports on the affected ICP scanners." *Id.*, pp. 3-4.

85. The EAC Report further noted that "[o]n February 11, 2022, Dominion submitted a Root Cause Analysis (RCA) to the EAC. The report indicates that erroneous code is present in the EAC certified D-Suite 5.5-B and D-Suite 5.5-C systems. The RCA report states that when the anomaly occurs, it's due to a misread of the QR code. If the QR code misread affects a certain part of the QR code, the ICP scanner mistakenly interprets a bit in the code that marks the ballot as provisional. Once that misread happens, the provisional flag is not properly reset after that ballot's voting session. The result is that every ballot

scanned and tabulated by the machine after that misread is marked as provisional and thus, not included in the tabulator's close poll report totals."

86.   As alleged in this Complaint, and as demonstrated by these aforementioned allegations and the reports and analyses conducted and discussed herein, Dominion required in its contract that Fulton County (and whatever party contracted to use their machines), accept its certification and testing parameters, where Dominion was largely responsible for ensuring that Dominion Voting Machine Systems passed certification requirements and logic and accuracy testing, and Dominion Voting Machines did not meet the conditions required for basic certification and testing sufficient to ensure the integrity of the elections for the citizens of Fulton County.

COUNT I – BREACH OF CONTRACT

87.   To establish an action for breach of contract, a party must demonstrate the existence of a contract, a breach of a duty imposed by the contract, and damages. J.F. Walker Co. v. Excalibur Oil Group, Inc., 2002 PA Super 39, 792 A.2d 1269, 1272 (Pa. Super. 2002).

88.   The Agreement between Fulton County and Dominion constituted a contract whereby for consideration and according to the schedule of payments and its terms, Fulton County paid Dominion to provide equipment and services.

89.   Under the Agreement, Dominion had a duty to, inter alia, ensure that the System was secure and compliant, and in a condition fit for use and purpose

and the service it was held out to provide to Fulton County ("voting system services, software licenses and related services"), in consideration for Fulton County's signing onto the terms and conditions of the Agreement. (**EXHIBIT A-1**).

90.   Sufficient product delivery and services were dependent on successful completion of the acceptance testing and the failure of the conditions to certification described above constituted a failure in and impossibility of the Acceptance provision in the Agreement. **EXHIBIT A-1, A-4, ¶ 8.1.**

91.   Acceptance terms in the Agreement that made it impossible for Fulton County to refuse to grant Acceptance based on a failure of the System to conform with the specifications, requirements and functions set out in the Agreement were onerous and against public policy, and in any event constituted a breach of Dominion's obligations to provide "voting system services, software licenses and related services" fit for use and purpose as promised and held out to Fulton County by Dominion.

92.   Prior reports, including the Wake TSI Report (**EXHIBIT D**) and the September Report (**EXHIBIT E**) confirmed that many of the "conditions" in the certification report which were required to be met for certification and proper functioning of the Dominion Voting System were not met and were not present before, during and after the November 2020 election and up until the time Fulton County ceased using the Dominion Voting System. See, **EXHIBIT B**, pp. 40-50

93. Based on information and belief and the allegations herein, Dominion breached that part of the Agreement in which warranted that when used with the hardware and software configuration purchased through or approved by Dominion, each component of Dominion Hardware would be free of defects that would prevent the Dominion Hardware from operating in conformity in all material respects with its specifications as documented by Dominion." **EXHIBIT A-5, ¶ 9.3.**

94. Dominion breached this duty because it failed to provide a system that was free from defects and compliant.

95. As a result of Dominion's breach, Fulton County (and Fulton County's citizens) suffered damages including, the inability to ensure compliance with the requirements of state and federal law, and the constitutional rights of Fulton County's voters.

96. As a result of Dominion's breach, Fulton County (and Fulton County's citizens) suffered damages, including capital outlay and expenditures that were borne by Fulton County citizen taxpayers, which outlay and expenditures were made in consideration and reliance upon a voting system that did not maintain and ensure the integrity and sanctity of the voting process and protect and preserve the constitutional rights of all Fulton County citizens.

COUNT II – BREACH OF WARRANTY

97.   Based on information and belief and the allegations herein, Dominion breached that part of the Agreement in which warranted that when used with the hardware and software configuration purchased through or approved by Dominion, each component of Dominion Hardware would be free of defects that would prevent the Dominion Hardware from operating in conformity in all material respects with its specifications as documented by Dominion."

EXHIBIT A-5, ¶ 9.3.

98.   Dominion breached this duty because it failed to provide a system that was free from defects and compliant.

99.   As a result of Dominion's breach, Fulton County (and Fulton County's constituents) suffered damages including, the inability to ensure compliance with the requirements of state and federal law, and the constitutional rights of Fulton County's voters.

100.   As a result of Dominion's breach, Fulton County (and Fulton County's citizens) suffered damages including, the inability to ensure compliance with the requirements of state and federal law, and the constitutional rights of Fulton County's voters.

101.   As a result of Dominion's breach, Fulton County (and Fulton County's citizens) suffered damages, including capital outlay and expenditures that were borne by Fulton County citizen taxpayers, which outlay and expenditures were made in consideration and reliance upon a voting system that

did not maintain and ensure the integrity and sanctity of the voting process and protect and preserve the constitutional rights of all Fulton County citizens.

RELIEF REQUESTED

WHEREFORE, as alleged in this Complaint, and Fulton County claims breach of contract and breach of warranty, and breach of other common-law and statutory duties, by Dominion, which entitles Fulton County to Damages as alleged herein, including, but not limited to all fees, expenditures and costs made in reliance upon and in consideration for the provision by Dominion of a serviceable product that was fit for its intended purpose and use.

WHEREFORE, Fulton County reserves the right to amend this Complaint to add allegations and claims and parties that Fulton County may become aware of through the ordinary course of this litigation and/or through additional discovery.

WHEREFORE, Fulton County prays that this Court enter judgment against Dominion on the claims and counts herein presented, and award any other damages, including costs and attorneys fees, which justice requires.

Respectfully submitted,

VERIFICATION

I, <u>Thomas J. Carroll, Esquire,</u> hereby verify that I represent Plaintiffs, Fulton County, in this action and that the statements made in the foregoing pleadings are true and correct to the best of my knowledge, information, and belief. The undersigned understands that the statements therein are made subject to the penalties of 18 Pa. C.S. section 4904 relating to unsworn falsification to authorities.

_____

THOMAS J. CARROLL

Date: September 20, 2022

28

CERTIFICATE OF SERVICE

I, Thomas J. Carroll, hereby certify that a true and correct copy of the foregoing document was served upon or sent to the following via First Class Mail to Dominion Voting Systems, Inc. and U.S. Dominion, Inc., 1201, 18th Street, Suite 210, Denver, CO, 80202.

EXHIBIT A

MANAGED SERVICES AGREEMENT BETWEEN FULTON COUNTY AND DOMINION,

AUGUST 20, 2019

VOTING SYSTEM AND MANAGED SERVICES AGREEMENT
BY AND BETWEEN
DOMINION VOTING SYSTEMS, INC.
AND FULTON COUNTY, PA

This Managed Services Agreement (the "Agreement"), dated April 1, 2019 (the "Effective Date"), for a voting system services, software licenses and related services is made by and between Fulton County, PA, having its principal office located at 116 W. Market Street, Suite 203 McConnellburg, PA 17233 (hereinafter the "Customer"), and Dominion Voting Systems Inc., having its principal office located at 1201 18th Street, Suite 210, Denver, CO 80202 (hereinafter "Dominion"). This Agreement may refer to Dominion and the Customer together as the "Parties," or may refer to Dominion or the Customer individually as a "Party."

WHEREAS, the Customer desires to purchase voting system services, and software use licenses; and

WHEREAS, Dominion designs, manufactures, licenses, and provides services for its voting systems.

NOW THEREFORE, in consideration of the mutual covenants contained herein, and in accordance with the terms and conditions set forth herein, Dominion agrees to license and furnish the System (as defined herein) to the Customer.

1. **Composition of Agreement.** Exhibits A and B are attached and incorporated herein by reference and form a part of this Agreement. This Agreement consists of the terms and conditions contained in the following sections and the listed Exhibits:

   Exhibit A: Pricing/Payment Summary and Deliverables Description
   Exhibit B: Software License Terms and Conditions

2. **Definitions.** For the purposes of this Agreement, the following are defined terms:

   2.1. "Acceptance" and variations thereof, means the successful completion by the Customer of the acceptance testing performed on each component of Dominion Hardware and Software, after delivery in accordance with testing criteria developed and agreed to by the parties, or the occurrence of other events defined in Section 8.

   2.2 "Confidential Information" means those materials, documents, data, and technical information, specifications, business information, customer information, or other information of a Party (the "Disclosing Party") maintains as trade secrets or confidential and which are disclosed to a another Party (the "Receiving Party") in tangible form conspicuously marked as "confidential," or with words having similar meaning, which includes without limitation, Dominion Software and associated documentation.

   2.3. "Dominion Hardware" means the ImageCast® system hardware as more specifically described in Exhibit A.

2.4.   "Dominion Software" means software and firmware programs licensed to the Customer by Dominion and any associated documentation as more specifically described in Exhibit A.

2.5.   "Election" means a single election event administered by the Customer including any absentee and early voting activity associated with the election event. Election shall not mean any follow-on events occurring after the initial election event, including without limitations, run-offs or recall replacements elections. Any follow on event shall be considered an Election in and of itself.

2.6.   "Election Management System Hardware" or "EMS Hardware" means third party hardware required for operating Dominion Software as used in conjunction with the Dominion Hardware.

2.7.   "License" has the meaning set forth in Section 7.

2.8.   "System" means the combination of Dominion Software, Dominion Hardware and EMS Hardware.

2.9.   "Third Party Software" means manufacturer supplied software, or firmware owned by third parties, which Dominion provides to Customer pursuant to sublicenses or end user license agreements with the owners of such Third Party Software. Third Party Software includes, but is not limited to, various operating systems, software drivers, report writing subroutines, and firmware.

3.   **Term of Agreement.** The Term of this Agreement shall begin on the Effective Date and shall continue until December 31, 2026, unless sooner terminated or extended as provided herein.

4.   **Dominion's Responsibilities.** Dominion shall:

4.1.   Deliver the System and services as described in Exhibit A - Pricing and Payment Summary and Deliverables Description.

4.2.   Provide the Customer with a Dominion Software use License as described in Exhibit B - Software License Terms.

4.3.   Assign a Dominion project manager ("Dominion Project Manager") to oversee the general operations of the project. The Dominion Project Manager will be the primary contact for all project needs. The Dominion Project Manager will be responsible for all deliverables and services including, resource planning and coordination, product delivery, issue resolution and for all administrative matters such as invoices and payments.

4.4.   Assist in the Acceptance testing process as required by Section 8 herein.

4.5. Provide Customer with one (1) reproducible electronic copy of the documentation.

4.6. Provide invoices to Customer pursuant to the payment schedule in Exhibit A and the payment terms described in Section 5.1 herein.

5. **Customer's Responsibilities.** Customer shall:

5.1. Pay invoices in a timely manner and no later than thirty (30) calendar days from receipt of a Dominion invoice.

    5.1.1. Dominion shall issue invoices to Customer pursuant to the invoice schedule listed in Exhibit A.

    5.1.2. Payments specified in this Section 5 are exclusive of all excise, sale, use and other taxes imposed by any governmental authority, all of which shall be reimbursed by the Customer. If the Customer is exempt from taxes, Customer shall supply Dominion a tax exemption certificate or other similar form demonstrating its exempt status.

5.2. Assign a Customer project manager ("Customer Project Manager"), who shall be responsible for review, analysis and acceptance of the System and the coordination of Customer personnel, equipment, vehicles and facilities. The Customer Project Manager shall be empowered to make decisions on behalf of the Customer with respect to the work being performed under this Agreement. The Customer Project Manager shall also have direct access to the Customer's top management at all times for purposes of problem resolution.

5.3. Conduct Acceptance testing process as required by Section 8.

5.4 Customer shall provide reasonable access and entry into all Customer property required by Dominion to perform the services described in this Agreement. All such access and entry shall be provided at Customer's expense.

5.5 When applicable, for election setup and database creation services as described in Exhibit A, the Customer shall review and approve or identify issues to all Dominion deliverables related to such service within two (2) business days of receipt by the Customer. In the event the Customer discovers an issue, it shall provide written notice to Dominion immediately following the discovery of any issue and Dominion shall rectify the issue at no additional cost to the Customer. In the event the Customer approves the deliverable and subsequent to such approval, request that a change be made to the deliverable, then Dominion may provide the change at an additional cost based upon Dominion's then current published service rates.

6.   Title and Risk of Loss.

6.1.   Title to the System. The System shall be provided by Dominion to the Customer as part of the managed services described herein. Title to the System or any portion thereof, shall not pass to the Customer and shall remain with Dominion.

6.2.   Software. Dominion Software and Third Party Software is licensed, not sold. The original and any copies of the Dominion Software, or other software provided pursuant to this agreement, in whole or in part, including any subsequent improvements or updates, shall remain the property of Dominion, or any third party that owns such software.

6.3.   Risk of Loss. Dominion shall bear the responsibility for all risk of physical loss or damage to each portion of the System until such portion is delivered to the Customer. Customer shall provide Dominion with a single location for shipment and Dominion shall not be responsible for shipping to more than one location. To retain the benefit of this clause, Customer shall notify Dominion of any loss or damage within ten (10) business days of the receipt of any or all portions of the System, or such shorter period as may be required to comply with the claims requirements of the shipper, and shall cooperate in the processing of any claims made by Dominion.

7.   Software License and Use.

7.1.   License. Upon mutual execution of this Agreement, Dominion grants to the Customer, and the Customer accepts a non-exclusive, non-transferable, license ("License") to use the Dominion Software subject to the terms and conditions of this Agreement and the Software License Terms attached hereto as Exhibit B.

7.2.   Third Party Software. The System includes Third Party Software, the use of which is subject to the terms and conditions imposed by the owners of such Third Party Software. Customer consents to the terms and conditions of the third party License Agreements by Customer's first use of the System.

8.   Acceptance.

8.1.   Dominion Software or Dominion Hardware Testing. After delivery of Dominion Software or Dominion Hardware, the Customer will conduct Acceptance testing of such units, in accordance with the Acceptance criteria developed, updated, and delivered to Customer in writing, from time to time, by Dominion. Such Acceptance testing shall occur at a time mutually agreed upon by the Parties, but no later than ten (10) business days after installation.

8.2.   System Acceptance Testing. To the extent not tested as part of the testing pursuant to Subsections 8.1, upon completing the installation of the System, the Customer

FULTON COUNTY V. DOMINION, EXHIBIT A-4

will conduct system acceptance testing, according to the Acceptance test procedures developed and updated, from time to time, by Dominion. Such Acceptance testing shall occur at a time mutually agreed upon by the Parties, but no later than ten (10) business days after installation of the System.

8.3. Acceptance/Rejection.   After testing, if the Dominion Software, Dominion Hardware, or the System does not conform to user documentation or Dominion provided Acceptance criteria, Customer will notify Dominion in writing within five (5) business days.   Dominion will, at its own expense, repair or replace the rejected Dominion Software, Dominion Hardware, or System within thirty (30) days after receipt of Customer's notice of deficiency.   The foregoing procedure will be repeated until Customer finally accepts or rejects the Dominion Software, Dominion Hardware, or System in writing in its sole discretion.

8.4 System Conformance. Customer will not refuse to grant Acceptance of the System, in whole or in part, solely for the reason that it fails to conform with the specifications, requirements and functions set out in the Agreement in a manner that does not affect the performance of the System, in whole or in part. In such instance of non-conformity, Dominion shall provide a plan of action to cure such non-conformity with reasonable dispatch.

9. Warranties.

9.1. Dominion Software Warranty.   The Dominion Software warranty is subject to the terms and conditions of Exhibit B - the Software License Terms.

9.2. Third Party Products. The warranties in this Sections 9 do not apply to any third party products.   However, to the extent permitted by the manufacturers of third party products, Dominion shall pass through to Customer all warranties such manufacturers make to Dominion regarding the operation of third party products.

9.3. Dominion Hardware Warranty Terms. Dominion warrants that when used with the hardware and software configuration purchased through or approved by Dominion, each component of Dominion Hardware will be free of defects that would prevent the Dominion Hardware from operating in conformity in all material respects with its specifications as documented by Dominion. The Dominion Hardware Warranty shall remain in effect during the Agreement Term.

9.4. Dominion Hardware Warranty Services. If any Dominion Hardware component fails to operate in conformity with its specifications during the warranty period, Dominion shall provide a replacement for the Dominion Hardware component or, at Dominion's sole option, shall repair the Dominion Hardware component, so long as the Dominion Hardware is operated with its designated Dominion Software and with third party products approved by Dominion for use with the Dominion Hardware. The following conditions apply to the Dominion Hardware warranty:

FULTON COUNTY V. DOMINION, EXHIBIT A-5

9.4.1.   Customer shall bear the shipping costs to return the malfunctioning component of Dominion Hardware to Dominion, and Dominion shall bear the costs for standard shipping of the repaired or replaced component of Dominion Hardware to Customer.

9.4.2.   The following services are not covered by this Agreement, but may be available at Dominion's current time and material rates:

9.4.2.1.   Replacement of consumable items including but not limited to batteries, paper rolls, ribbons, seals, smart cards, and removable memory devices, scanner rollers, disks, etc.;

9.4.2.2.   Repair or replacement of Dominion Hardware damaged by accident, disaster, theft, vandalism, neglect, abuse, or any improper usage;

9.4.2.3.   Repair or replacement of Dominion Hardware modified by any person other than those authorized in writing by Dominion;

9.4.2.4.   Repair or replacement of Dominion Hardware from which the serial numbers have been removed, defaced or changed.

9.5.   No Other Warranties. DOMINION DISCLAIMS ALL OTHER WARRANTIES, AND REPRESENTATIONS, WHETHER WRITTEN, ORAL, EXPRESS, OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE AND ANY WARRANTY BASED ON A COURSE OF DEALING, COURSE OF PERFORMANCE OR USAGE OF TRADE.

10. Force Majeure. Should any circumstances beyond the control of Dominion or Customer occur that delay or render impossible the performance of any obligation due under this Agreement, such obligation will be postponed for the period of any delay resulting from any such circumstances, plus a reasonable period to accommodate adjustment to such extension, or cancelled if performance has been rendered impossible thereby. Such events may include, without limitation, accidents; war, acts of terrorism; natural disasters; labor disputes; acts, laws, rules or regulations of any government or government agency; or other events beyond the control of both Dominion and Customer. Neither Party shall be liable under this Agreement for any loss or damage to the other Party due to such delay or performance failures. Notwithstanding the foregoing, both Parties shall use their commercially reasonable efforts to minimize the adverse consequences of any such circumstances. This Section shall not operate to excuse any Party from paying amounts that are owed pursuant to this Agreement.

11. Indemnification. Dominion, at its sole expense, will indemnify and defend the Customer, its officers, agents and employees from and against any loss, cost, expense or liability (including but not limited to attorney's fees and awarded damages) arising out of a claim, suit or action that the System infringes, violates, or misappropriates a Third Party's patent, copyright, trademark, trade secret or other intellectual property or proprietary rights.

12.   **Limitation of Liability.** DOMINION'S TOTAL AGGREGATE LIABILITY FOR ANY LOSS, DAMAGE, COSTS OR EXPENSES UNDER OR IN CONNECTION WITH THIS AGREEMENT, HOWSOEVER ARISING, INCLUDING WITHOUT LIMITATION, LOSS, DAMAGE, COSTS OR EXPENSES CAUSED BY BREACH OF CONTRACT, NEGLIGENCE, STRICT LIABILITY, BREACH OF STATUTORY OR ANY OTHER DUTY SHALL IN NO CIRCUMSTANCES EXCEED 200% OF THE TOTAL DOLLAR AMOUNT OF THE AGREEMENT. NEITHER PARTY SHALL BE LIABLE FOR ANY LOSS OF PROFITS, LOSS OF BUSINESS, LOSS OF DATA, LOSS OF USE OR ANY OTHER INDIRECT, INCIDENTAL, PUNITIVE, SPECIAL OR CONSEQUENTIAL LOSS OR DAMAGE WHATSOEVER, HOWSOEVER ARISING, INCURRED BY THE OTHER PARTY OR ANY THIRD PARTY, WHETHER IN AN ACTION IN CONTRACT, NEGLIGENCE OR OTHER TORT, EVEN IF THE PARTIES OR THEIR REPRESENTATIVES HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. NOTWITHSTANDING ANYTHING IN THE AGREEMENT TO THE CONTRARY, THIS SECTION DOES NOT LIMIT (1) THE INDEMNIFICATION OBLIGATION UNDER SECTION 11, (2) DAMAGES CAUSED BY DOMINION'S GROSS NEGLIGENCE OR WILLFUL MISCONDUCT.

13.   **Confidential Information.**

13.1.   Each Party shall treat the other Party's Confidential Information as confidential within their respective organizations and each Party shall be given the ability to defend the confidentiality of its Confidential Information to the maximum extent allowable under the law prior to disclosure by the other Party of such Confidential Information.

13.2.   Subject to the requirements of the Customer's public record laws ("PRL"), neither Party shall disclose the other Party's Confidential Information to any person outside their respective organizations unless disclosure is made in response to, or because of, an obligation to any federal, state, or local governmental agency or court with appropriate jurisdiction, or to any person properly seeking discovery before any such agency or court.

13.3.   Any specific information that Dominion claims to be confidential must be clearly marked or identified as such by the Customer. To the extent consistent with PRL, Customer shall maintain the confidentiality of all such information marked by Dominion as confidential. If a request is made to view such Confidential Information, Customer will notify Dominion of such request and the date the information will be released to the requestor unless Dominion obtains a court order enjoining such disclosure. If Dominion fails to obtain such court order enjoining such disclosure, the Customer will release the requested information on the date specified. Such release shall be deemed to have been made with Dominion's consent and shall not be deemed to be a violation of law or this Agreement.

14.   **Assignment.** Neither Party may assign its rights, obligations, or interests in this Agreement without the written consent of the other Party, providing however that Dominion may assign the

proceeds of this Agreement to a financial institution without prior consent of the Customer but with written notice to Customer.

15. Termination.

15.1   For Default.   In the event either Party violates any provisions of this Agreement, the non-violating Party may serve written notice upon the violating Party identifying the violation and a providing a reasonable cure period. Except as otherwise noted herein, such cure period shall be at least thirty (30) days. In the event the violating Party has not remedied the infraction at the end of the cure period, the non-violating Party may serve written notice upon the violating Party of termination, and seek legal remedies for breach of contract as allowed hereunder. If the breach identified in the notice cannot be completely cured within the specified time period, no default shall occur if the Party receiving the notice begins curative action within the specified time period and thereafter proceeds with reasonable diligence and in good faith to cure the breach as soon as practicable.

15.2   For Non-Appropriation of Funds.   The Customer shall not be obligated for payments hereunder for any future fiscal year unless or until the Customer appropriates funds for this Agreement in Customer's budget for that fiscal year. In the event that funds are not appropriated, then this Agreement may be terminated by the Customer as the end of the last fiscal year for which funds were appropriated. Termination of this Agreement by the Customer under this Section 15.2 shall not constitute a breach of this Agreement by the Customer. Customer shall notify Dominion in writing of such non-appropriation at the earliest possible date which, in any event, shall be prior to Dominion performing services during any fiscal year for which an appropriation has not been made. In the event Customer notifies Dominion that sufficient funds have not been appropriated, or if in fact sufficient funds have not been appropriated, to compensate Dominion in accordance with this Agreement, Dominion may suspend Dominion's performance and terminate all Dominion licenses under this Agreement. Suspension of performance and termination of all Dominion licenses by Dominion in accordance with this section 15.2 shall not constitute a breach of this Agreement by Dominion.

15.3   For Non-Certification of the Voting System.   In the event that Dominion does not achieve State of Pennsylvania voting system certification for the System provided to the Customer as part of this Agreement (as more specifically described in Exhibit A) by June 30 2019, then the Customer may terminate this Agreement at will. Should the Agreement be terminated pursuant to this Section 15.3, Dominion shall refund all payments made by the Customer. In addition, Dominion shall pay for all costs associated with retrieving the System from the Customer.

16. **Legality and Severability.** This Agreement and the Parties' actions under this Agreement shall comply with all applicable federal, state and local laws, ordinances, rules, regulations, court orders, and applicable governmental agency orders. If any term or provision of this Agreement is held to be illegal or unenforceable, the remainder of this Agreement shall not be affected thereby

FULTON COUNTY V. DOMINION, EXHIBIT A-8

and each term or provision of this Agreement shall be valid and enforceable to the fullest extent permitted by law. The Parties agree that any court reviewing this Agreement shall reform any illegal or unenforceable provision to carry out the express intent of the parties as set forth herein to the fullest extent permitted by law.

17.   Survival. The provisions of Sections 2, 9, 10, 11, 13, 16, 18, and 19 shall survive the expiration or termination of this Agreement.

18.   Choice of Law. Interpretation of this Agreement shall be governed by the laws of the Customer's State, and the courts of competent jurisdiction located in the Customer's State will have jurisdiction to hear and determine questions relating to this Agreement.

19.   Waiver. Any failure of a Party to assert any right under this Agreement shall not constitute a waiver or a termination of that right or any provisions of this Agreement.

20.   Independent Contractor. Dominion and its agents and employees are independent contractors performing professional services for the Customer and are not employees of the Customer. Dominion and its agents and employees shall not accrue leave, retirement, insurance, bonding, use of Customer vehicles, or any other benefits afforded to employees of the Customer as a result of this Agreement. Dominion acknowledges that all sums received hereunder are personally reportable by it for income tax purposes as self-employment or business income and are reportable for self-employment tax.

21.   Notices. All notices required or permitted to be given hereunder shall be given in writing and shall be deemed to have been given when personally delivered or by nationally recognized overnight carrier or mailed, certified or registered mail, return receipt requested, addressed to the intended recipient as follows:

If to Dominion:

    Dominion Voting Systems, Inc.
    Attn: Contracts Administrator
    1201 18th St., Ste. 210
    Denver, CO 80202

If to the Customer:

    Fulton County ~~Director of~~ Elections & Voter Registration
    ~~Attn: Karen Hann~~
    116 W. Market Street, Suite 203
    McConnellburg, PA 17233

22.   Entire Agreement. This Agreement and its Exhibits incorporated herein by reference constitute the entire agreement, understanding and representations between Dominion and the Customer, and supersede and replace all prior agreements, written or oral. No modifications or representations to the Agreement shall be valid unless made in writing and signed by duly authorized representatives of both the Customer and Dominion, and incorporated as an Addendum hereto.

FULTON COUNTY V. DOMINION, EXHIBIT A-9

23.   Third-Party Beneficiary. No person shall be a third-party beneficiary pursuant to this Agreement. No obligation of Dominion or Customer may be enforced against Dominion or Customer, as applicable, by any person not a party to this Agreement.

Signature Page Follows

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed as of the date first above written.

DOMINION VOTING SYSTEMS, INC.

_____
AUTHORIZED SIGNATURE

John Poulos
PRINTED NAME

President & CEO
TITLE

8/14/2019
DATE

FULTON COUNTY, PA

_____
AUTHORIZED SIGNATURE

Stuart L Ulsh
PRINTED NAME

Commissioner   Chair
TITLE

8/20/19
DATE

FULTON COUNTY V. DOMINION, EXHIBIT A-11

EXHIBIT A
VOTING SYSTEM AGREEMENT
BY AND BETWEEN DOMINION VOTING SYSTEMS
AND FULTON COUNTY, PA

PRICING SUMMARY AND DELIVERABLES DESCRIPTION

1. Pricing/Payment Summary and Descriptions

   1.1 **Pricing and Payment Summary.** The total annual managed service contract pricing shall equal **$31,931.00**/year for a total of eight (8) years. The following is the invoicing schedule for the annual Customer payments. The Customer shall pay invoices in a timely manner and no later than thirty (30) calendar days from receipt of a Dominion invoice. All payments shall be made is in U.S. Dollars. Pricing does not include shipping or any applicable taxes.

   1.1.1 Year 1 shall cover the time period from the Agreement Effective Date through December 31, 2019. The Year 1 invoice of **$31,931.00** will be issued immediately after System certification by the State of Pennsylvania. Under no circumstance will payment be made by the Customer until the System is certified for use by the State of Pennsylvania and all Acceptance testing has been completed to the satisfaction of Customer.

   1.1.2 Year 2: 1/1/2020 – 12/31/2020: **$31,931.00** invoice will be issued on 1/1/2020

   1.1.3 Year 3: 1/1/2021 – 12/31/2021: **$31,931.00** invoice will be issued on 1/1/2021

   1.1.4 Year 4: 1/1/2022 – 12/31/2022: **$31,931.00** invoice will be issued on 1/1/2022

   1.1.5 Year 5: 1/1/2023 – 12/31/2023: **$31,931.00** invoice will be issued on 1/1/2023

   1.1.6 Year 6: 1/1/2024 – 12/31/2024: **$31,931.00** invoice will be issued on 1/1/2024

   1.1.7 Year 7: 1/1/2025 – 12/31/2025: **$31,931.00** invoice will be issued on 1/1/2025

   1.1.8 Year 8: 1/1/2026 – 12/31/2026: **$31,931.00** invoice will be issued on 1/1/2026

2. System Description - Prices of equipment, technical facilities, software, and other related services for voting, vote counting, and result processing.

DESCRIPTION	QTY
Central Scanning Solution: Absentee / Central Count	
ImageCast Central Kit: Canon M160II Document scanner includes: ImageCast Central Software, Dell Optiplex 7440 All-in-One, iButton programmer and key, cables	2
In-Person Voting Solution: Polling Location Hardware	
ImageCast X BMD (21 inch) Kit includes: ICX Firmware, Tablet, 5 voter activation cards, printer, cables, power cord	15
Universal Power Supply (UPS) for ICX BMD	15
Audio Tactile Interface (ATI) Accessible Unit	15
ImageCast X Voting Booth - Standard	12
ICX Prime BMD Bag Kit	15

FULTON COUNTY V. DOMINION, EXHIBIT A-12

Election Management Hardware	
Democracy Suite EMS Express Server Configuration Kit - Up to 7 clients	1
EMS Client Workstation Configuration Kit	1
Adjudication Workstation Kit	1
Software Licenses	
Democracy Suite (EMS) Application	1
ICC Adjudication Application	1
Automated Test Decks Application	1
Support and Implementation Services	**#**
Project Management	5
Training	5
On-Site Election Support (3 days for each Election)	2

3. Detailed Descriptions

    3.1 **ImageCast Central Scanner (ICC).** The ImageCast Central Scanner is commercial off-the-shelf digital scanners configured to work with the ImageCast Central Software for high speed ballot tabulation. Each ImageCast Central Scanner includes the following components:

        3.1.1 Canon M160II document scanner

        3.1.2 ImageCast Central Software

        3.1.3 OptiPlex 7440 All-in-One Series with pre-loaded software

        3.1.4 iButton Security Key

        3.1.5 iButton Programmer and iButton Key Switch & Cat5 RJ 45 Cables used with Democracy Suite to transfer security and election information to the iButtons for use with the ICC.

    3.2 **ImageCast® X ("ICX").**

        3.2.1 Application: ImageCast X BMD is a touchscreen in-person voting device and ballot marking device. Voting sessions are initiated on the tablet by either a smart card or the entry of a numeric code based on activation. The ballot is loaded directly onto the standalone device. All voting activity is performed at the tablet, including accessible voting. Accessible voting interfaces connect to the tablet via an Audio Tactile Interface or ATI. After the voter reviews the ballot selections, a paper ballot is created for the voter from a printer in the voting booth. The printed ballot contains a written summary of the voter's choices, as well as a 2D barcode which is read by Dominion's ImageCast Precinct tabulator. No votes are stored on the ImageCast X-BMD unit. All votes can be tabulated and stored both the ImageCast Precinct Tabulators.

        3.2.2 Components: ImageCast X BMD is composed of a 21" Avalue touchscreen, Android OS 4.4.4, DC 19V input, HP LaserJet Pro M402dne laser printer, 6' cable, 5 smart cards, and 8GB flash drive.

FULTON COUNTY V. DOMINION, EXHIBIT A-13

3.3 **Audio Tactile Device ("ATI").** The ATI connects to the ICX via the port located on the right side of the unit. A set of headphones connects directly to the ATI controller. Following the audio voting process using the ATI controller, the ICX-BMD printer produces a marked paper ballot which serves as the official ballot record.

3.4 **ImageCast Software.** The Parties will enter into software licenses for the ImageCast software, substantially in the form of Exhibit B to this Agreement. The Dominion software includes, without limitation:

    3.4.1 AuditMark[1]. For each ballot that is scanned and accepted into the unit, a corresponding ballot image is created and stored for audit purposes. The image consists of two parts described below.

- The top portion of the image contains a scanned image of the ballot.

- The bottom portion consists of a machine-generated type-out showing each mark that the unit interpreted for that particular ballot. This is referred to as an AuditMark.

3.5 **Democracy Suite Software** is suite of election management software that supports all ImageCast voting channels from a single comprehensive database. The Democracy Suite EMS consists of the following components:

    3.5.1 Election Event Designer (EED). The EED Client Application is the primary application used for the definition and management of election event. EED is responsible for the definition of election projects. Each election project is represented as an instance of the election domain database with associated set of election project file based artifacts. The definition of the election project can be initiated by importing the election data through the Election Data Translator (EDT) module from external systems or by defining election project entities without importing external data. It is important to note that an election project initiated through EDT can be further modified within the EED Client Application. The system can generate two types of paper ballots:

- Proofing ballots – ballots produced to allow election officials the ability to proof ballot content and styling. These ballots cannot be processed by the ImageCast as they don't have proper ballot barcodes. These ballots are overprinted with the text "Proofing Ballots – date/time"

- Official ballots – represent production ready, press ready ballots in PDF format with barcodes and without any overprinting.

    3.5.2 Results Tally and Reporting (RTR). The RTR Client Application is the application used for the tally, reporting and publishing of election results.

    3.5.3 ImageCast Adjudication Application. The Adjudication application is a client and server application used to review and adjudicate ImageCast Central Scanner ballot images. The application uses tabulator results files and scanned images to allow election administrators to make adjudications to ballots with auditing and reporting capabilities. The Adjudication Application examines such voter exceptions as overvotes, undervotes, blank contests,

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[1] AuditMark is a registered trademark of Dominion Voting Systems Inc.

FULTON COUNTY V. DOMINION, EXHIBIT A-14

blank ballots, write-in selections, and marginal marks. The application works in two basic modes: election project setup and adjudication. The Adjudication Application can be used in a multi-client environment. Adjudication Application eliminates the need to physically rescan ballots, which can potentially damage the originals and cause chain-of-custody concerns

3.5.4   Audio Studio.   The system uses Cepstral, a third-party text-to-audio synthesizer, to automatically generate audio ballots for the ImageCast X Ballot Marking Device. The County also has the option to import human-recorded audio, with or without the use of Audio Studio. Pronunciation may be modified using the Cepstral's Swifttalker application. The system outputs audio ballots (PNG images, SPX audio files and XML definition files), definition reports (XML, Excel or HTML files), and election definition files required to program the ImageCast X.

3.5.5   Automated Test Deck (ATD).   ATD is an application used to create test decks for running Pre-Logic and Accuracy Test with marking pattern requirements. The application can be used to access the election database and produce a set of print-ready PDFs and results tables for testing.

3.6   *Support and Implementation Services.*

3.7.1   Project Management Support.   Dominion will provide Project management support to oversee the general operations of the Project through the Agreement Term. The Project manager is responsible for arranging all meetings, visits and consultations between the parties and for all administrative matters such as invoices, payments and amendments. The Parties shall develop and finalize a Project implementation plan including a training and delivery schedule. The Parties agree that during the course of the implementation, changes to the Project schedule may be required. Any changes to the Project schedule must be mutually agreed to by both Parties and such agreement shall not be unreasonably withheld.

3.7.2   System Acceptance Testing Support.   Dominion will provide direct onsite training and support during the System Acceptance Testing period.

3.7.3   ImageCast X -- This training introduces the ImageCast X system with an emphasis on the operation of the hardware. Students can expect to learn general operations, logic and accuracy testing, Election Day setup and operation, and troubleshooting.

3.7.4   ImageCast® ICC -- This training introduces the ImageCast ICC with an emphasis on the operation of the hardware. Students can expect to learn general operations, logic and accuracy testing, ballot scanning operation, and troubleshooting. In addition, training will include resolution via the adjudication application.

3.7.5   EMS Server Installation, Configuration & Testing.   Dominion will provide a minimum total of one (1) day of direct onsite support for EMS Server installation, configuration & testing.

FULTON COUNTY V. DOMINION, EXHIBIT A-15

3.7.6   <u>Democracy Suite EMS System</u> – Training covers defining an election project in Democracy Suite EED. Topics include importing jurisdictional information, ballot layout, proofing and printing, election file creation (ICX, and ICC), automated test deck creation, loading elections, tallying results (including adjudication tally), and generating reports.

3.7.7   <u>On-Site Election Day Support.</u> Dominion will provide three (3) days (inclusive of travel) of direct onsite election support for two (2) elections.

3.8   **Travel and Expenses included.** All costs of Dominion transportation, lodging and meal expenses are included during the Agreement Term.

3.9   **Ongoing telephone support.** Telephone support shall be available for Customers during the Term of the Agreement at no additional costs.

3.10   **Other Services, Consumables or Equipment.** Any other services, consumables or equipment not specifically identified in this Agreement are available for purchase by the Customer at the then current Dominion list price.

FULTON COUNTY V. DOMINION, EXHIBIT A-16

EXHIBIT B

SOFTWARE LICENSE TERMS AND CONDITIONS

This Exhibit B is part of the Agreement between Dominion and Customer to which it is attached.

1.   Definitions. Capitalized terms used herein have the meaning given in the Agreement unless otherwise defined herein.

1.1.   "Agreement" means the agreement between the Parties for the use of the licensed Software to which this Exhibit B is attached and incorporated into.

1.2.   "Licensee" means Customer, as the term is defined in the Agreement.

1.3.   "Licensor" means Dominion Voting Systems, Inc.

1.4.   "Software" means Dominion Software, as the term is defined in the Agreement.

1.5.   "Specifications" means descriptions and data regarding the features, functions and performance of the Software, as set forth in user manuals or other applicable documentation provided by Licensor.

1.6.   "Third-Party Products" means any software or hardware obtained from third-party manufacturers or distributers and provided by Licensor hereunder.

2.   License Terms.

2.1.   License Limitations.   Licensee's use of the Software pursuant to the License granted in the Agreement is subject to the terms herein. Licensee may only use the Software for its own internal business purposes and conducting elections and solely in conjunction with the EMS Hardware. The License shall only be effective during the Term and cannot be transferred or sublicensed.

2.2.   Print Copyright License.   Subject to the Print Copyright License terms and conditions as defined in Schedule A attached hereto, Licensor grants to Licensee a non-exclusive, non-transferable print copyright license as defined in Schedule A.

2.3.   Third-Party Products.   When applicable, Licensor hereby sublicenses any software that constitutes or is contained in Third-Party Products, in object code form only, to Licensee for use during the Term.

2.4.   No Other Licenses. Other than as expressly set forth herein, (a) Licensor grants no licenses, expressly or by implication, and (b) Licensor's entering into the Agreement will not be deemed to license or assign any intellectual property rights of Licensor to Licensee or any third party. Licensee agrees not to use the Software as a service bureau for elections outside the Licensee's jurisdiction and agrees not to reverse engineer or otherwise attempt to derive the source code of the Software. The Licensee shall have no power to transfer or grant sub-licenses for the Software. Any use of all or any portion of the Software not expressly permitted is strictly prohibited.

2.5.   Intellectual Property Infringement Indemnification.   If a third party claims that the Software or System infringes any United States patent, copyright, trade secret or similar

FULTON COUNTY V. DOMINION, EXHIBIT A-17

intellectual property right, Dominion shall defend Licensee against such claim at Dominion's expense and pay all damages that a court finally awards against Licensee. If such a claim is made or appears possible, Dominion shall, within sixty (60) days of such claim, and at its option: (a) secure for Licensee the right to continue to use the infringing portion of the Software or System; or (b) modify or replace the Software and System so that it is non-infringing but retains equivalent functionality. If neither of the foregoing options is reasonably available, Dominion shall require Licensee to return the Software or System, and Dominion shall refund Licensee amounts calculated pursuant to the Software License fee, on a pro-rate basis. The foregoing notwithstanding, Dominion shall have no obligation to indemnify Licensee for any infringement claim based on Licensee's modification or misuse of the Software, if the claim would have been avoided had the Software not been modified or misused.

3.   **Payment.** In consideration of the grant of the license, the Licensee shall pay the license fees set forth in the Agreement and Exhibit A of the Agreement.

4.   **Upgrades and Certification.** During the Term, Licensor may provide upgrades to Licensee under the following terms and conditions.

4.1.   Upgrades.   In the event that Licensor, at its sole discretion, certifies a Software upgrade under the applicable laws and regulations of the Customer's State, Licensor shall make the certified Software upgrade available to the Licensee at no additional cost.

4.2.   Certification Requirement.   Notwithstanding any other terms of this Agreement, Licensor shall not provide, and shall not be obligated to provide under this Agreement any upgrade, enhancement or other software update that has not been certified under the applicable provisions of the election laws and regulations of the Customer's State.

5.   **Prohibited Acts.** The Licensee shall not, without the prior written permission of Licensor:

5.1.   Transfer or copy onto any other storage device or hardware or otherwise copy the Software in whole or in part except for purposes of system backup;

5.2.   Reverse engineer, disassemble, decompile, decipher or analyze the Software in whole or in part;

5.3.   Alter or modify the Software in any way or prepare any derivative works of the Software or any part of parts of the Software;

5.4.   Alter, remove or obstruct any copyright or proprietary notices from the Software, or fail to reproduce the same on any lawful copies of the Software.

6.   **Return of Software.** Upon termination or expiration of this Agreement, Licensee shall forthwith return to Licensor all Software in its possession or control, or destroy all such Software from any electronic media, and certify in writing to Licensor that it has been destroyed.

FULTON COUNTY V. DOMINION, EXHIBIT A-18

7.   **Warranties**. The following warranties will apply to all Software during the Term.

7.1.   Software Warranty Terms. Licensor warrants that the Software will function substantially in accordance with the Specifications during the Term.   The Licensor also warrants that the Software will comply with the voting system certification requirements and laws of the Customer's State (collectively the "Requirements") in effect as of the date the Software is certified by the certification authority of the Customer's State. This provision applies to the initially installed Software as well as any subsequent upgrades pursuant to Section 4 herein.   However, the Licensor will not be required to make modifications to the Software or System as a result of changes in the Requirements. The foregoing warranty will be void in the event of the Software (i) having been modified by any party other than Licensor or (ii) having been used by the Licensee for purposes other than those for which the Software was designed by Licensor.   If Licensor establishes that a failure of the foregoing warranty that is reported by Licensee is not covered by the foregoing warranty, the Licensee shall be responsible for the costs of Licensor's investigative and remedial work at Licensor's then current rates.

7.2.   Corrections. If the Licensee believes that the Software is not functioning substantially in accordance with the Specifications or Requirements, the Licensee shall provide Licensor with written notice of the material failure within thirty (30) days of discovering the material failure, provided that the Licensee can reproduce the material failure to Licensor.   The Licensor shall correct the deficiencies, at no additional cost to the Licensee and incorporate such corrections into the next version certified by the Customer's State.

7.3   Third-Party Products. The warranties herein do not apply to any Third-Party Products.   However, to the extent permitted by the manufacturers of Third-Party Products, Licensor shall pass through to Licensee all warranties such manufacturers make to Licensor regarding the operation of such Third-Party Products.

7.4.   NO OTHER WARRANTIES. EXCEPT AS SET FORTH IN THE AGREEMENT AND HEREIN, LICENSOR DISCLAIMS ALL OTHER REPRESENTATIONS AND WARRANTIES, WHETHER WRITTEN, ORAL, EXPRESS, OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE AND ANY WARRANTY BASED ON A COURSE OF DEALING, COURSE OF PERFORMANCE OR USAGE OF TRADE.

SCHEDULE A

PRINT COPYRIGHT LICENSE TERMS AND CONDITIONS

1. **Definitions.** For the purposes of this Agreement, the following are defined terms:

   1.1. "Derivative Works" means any work that is based upon or derived from the Licensor's voting systems' ballots, including without limitation, sample ballots and voting booklets.

   1.2. "Voting Systems' Ballots" means any ballot created for use with any voting system owned or licensed by the Licensor.

2. **Print Copyright License and Use.**

   2.1. Copyright License Grant. Licensor grants to the Licensee a non-exclusive, non-transferable copyright license to print, reproduce, distribute or otherwise copy the Licensor's Voting Systems' Ballots and any Derivative Works (collectively the "Materials") pursuant to the terms and conditions of this Schedule A.

   2.2. Copyright License Use. Other than as expressly set forth herein, (a) Licensor grants no other licenses, expressly or by implication, and (b) Licensor's entering into and performing the Agreement will not be deemed to license or assign any intellectual property rights of Licensor to Licensee or any third party, (c) the copyright license granted herein cannot be transferred or sublicensed and the Voting Systems' Ballots or Derivative Works cannot be reproduced by any third party without the prior written consent of the Licensor, including without limitation:

      (i)   any commercial or non-commercial printer
      (ii) any third party vendor using ballot on demand system.

   2.3. Rights and Interests. All right, title and interest in the Material, including without limitation, any copyright, shall remain with the Licensor.

3. **No Copyright Warranties.** EXCEPT AS SET FORTH HEREIN, LICENSOR DISCLAIMS ALL REPRESENTATIONS AND WARRANTIES, WHETHER WRITTEN, ORAL, EXPRESS, OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE AND ANY WARRANTY BASED ON A COURSE OF DEALING, COURSE OF PERFORMANCE OR USAGE OF TRADE.

FULTON COUNTY V. DOMINION, EXHIBIT A-20

AMENDMENT 1
TO THE VOTING SYSTEM AND MANAGED SERVICES AGREEMENT
BY AND BETWEEN
DOMINION VOTING SYSTEMS, INC.
AND FULTON COUNTY, PA

This Amendment 1 to the Voting Systems and Managed Services Agreement, is made and entered into as of this 15th day of September 2019 between Fulton County, PA ("Customer") and Dominion Voting Systems, Inc. ("Dominion").

RECITALS

WHEREAS, on April 1, 2019, the Customer and Dominion entered into a Voting Systems and Managed Services Agreement (the "Agreement"); and

WHEREAS, the Customer and Dominion now desire to amend the Agreement as described herein:

TERMS

NOW, THEREFORE, the parties amend the Agreement in accordance with the terms and conditions set forth below:

A.   **Incorporation of Recitals.** The above recitals are true and correct and incorporated herein by this reference as if fully set forth.

B.   **Exhibit A.** The Customer and Dominion agree to delete original Exhibit A of the Agreement in its entirety and replace it with the new Exhibit A attached hereto.

C.   **All Other Terms.** All other terms and provisions of the Agreement shall remain in full force and effect

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed as of the date first above written.

DOMINION VOTING SYSTEMS, INC.

Authorized Signature

John Poulos
Name

President & CEO
Title

9/15/2019
Date

FULTON COUNTY, PA
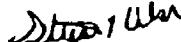
Authorized Signature

Rodney McCray
Name Arthur Lynch

Commissioner
Title

Sep 17, 2019
Date

FULTON COUNTY V. DOMINION, EXHIBIT A-22

EXHIBIT A
VOTING SYSTEM AGREEMENT
BY AND BETWEEN DOMINION VOTING SYSTEMS
AND FULTON COUNTY, PA

PRICING SUMMARY AND DELIVERABLES DESCRIPTION

1. Pricing/Payment Summary and Descriptions

    1.1 **Pricing and Payment Summary.** The total annual managed service contract pricing shall equal **$33,028.00/year** for a total of eight (8) years. The following is the invoicing schedule for the annual Customer payments. The Customer shall pay invoices in a timely manner and no later than thirty (30) calendar days from receipt of a Dominion invoice. All payments shall be made is in U.S. Dollars. Pricing does not include shipping or any applicable taxes.

        1.1.1 Year 1 shall cover the time period from the Agreement Effective Date through December 31, 2019. The Year 1 invoice of **$33,028.00** will be issued immediately after System certification by the State of Pennsylvania. Under no circumstance will payment be made by the Customer until the System is certified for use by the State of Pennsylvania and all Acceptance testing has been completed to the satisfaction of Customer.

        1.1.2 Year 2: 1/1/2020 – 12/31/2020: **$33,028.00** invoice will be issued on 1/1/2020

        1.1.3 Year 3: 1/1/2021 – 12/31/2021: **$33,028.00** invoice will be issued on 1/1/2021

        1.1.4 Year 4: 1/1/2022 – 12/31/2022: **$33,028.00** invoice will be issued on 1/1/2022

        1.1.5 Year 5: 1/1/2023 – 12/31/2023: **$33,028.00** invoice will be issued on 1/1/2023

        1.1.6 Year 6: 1/1/2024 – 12/31/2024: **$33,028.00** invoice will be issued on 1/1/2024

        1.1.7 Year 7: 1/1/2025 – 12/31/2025: **$33,028.00** invoice will be issued on 1/1/2025

        1.1.8 Year 8: 1/1/2026 – 12/31/2026: **$33,028.00** invoice will be issued on 1/1/2026

2. System Description - Prices of equipment, technical facilities, software, and other related services for voting, vote counting, and result processing.

DESCRIPTION	QTY
Central Scanning Solution: Absentee / Central Count	
ImageCast Central Kit: Canon M160II Document scanner includes: ImageCast Central Software, Dell Optiplex 7440 All-in-One, iButton programmer and key, cables	2
In-Person Voting Solution: Polling Location Hardware	
ImageCast X BMD (21 inch) Kit includes: ICX Firmware, Tablet, 5 voter activation cards, printer, cables, power cord	15
Mobile Ballot Printing Kit – Laser Printer, Laptop, cables	1
Universal Power Supply (UPS) for ICX BMD	15
Audio Tactile Interface (ATI) Accessible Unit	15
ImageCast X Voting Booth - Standard	12
ICX Prime BMD Bag Kit	15

FULTON COUNTY V. DOMINION, EXHIBIT A-23

Election Management Hardware	
Democracy Suite EMS Express Server Configuration Kit - Up to 7 clients	1
EMS Client Workstation Configuration Kit	1
Adjudication Workstation Kit	1
Software Licenses	
Democracy Suite (EMS) Application	1
ICC Adjudication Application	1
Automated Test Decks Application	1
Mobile Ballot Printing Application	1
Support and Implementation Services	#
Project Management	5
Training	5
On-Site Election Support (3 days for each Election)	2

3. <u>Detailed Descriptions</u>

3.1 ***ImageCast Central Scanner (ICC).*** The ImageCast Central Scanner is commercial off-the-shelf digital scanners configured to work with the ImageCast Central Software for high speed ballot tabulation. Each ImageCast Central Scanner includes the following components:

3.1.1 Canon M160II document scanner

3.1.2 ImageCast Central Software

3.1.3 OptiPlex 7440 All-in-One Series with pre-loaded software

3.1.4 iButton Security Key

3.1.5 iButton Programmer and iButton Key Switch & Cat5 RJ 45 Cables used with Democracy Suite to transfer security and election information to the iButtons for use with the ICC.

3.2 ***ImageCast® X ("ICX").***

3.2.1 <u>Application:</u> ImageCast X BMD is a touchscreen in-person voting device and ballot marking device. Voting sessions are initiated on the tablet by either a smart card or the entry of a numeric code based on activation. The ballot is loaded directly onto the standalone device. All voting activity is performed at the tablet, including accessible voting. Accessible voting interfaces connect to the tablet via an Audio Tactile Interface or ATI. After the voter reviews the ballot selections, a paper ballot is created for the voter from a printer in the voting booth. The printed ballot contains a written summary of the voter's choices, as well as a 2D barcode which is read by Dominion's ImageCast Precinct tabulator. No votes are stored on the ImageCast X-BMD unit. All votes can be tabulated and stored both the ImageCast Precinct Tabulators.

3.2.2 <u>Components:</u> ImageCast X BMD is composed of a 21" Avalue touchscreen, Android OS 4.4.4, DC 19V input, HP LaserJet Pro M402dne laser printer, 6' cable. 5 smart cards, and 8GB flash drive.

FULTON COUNTY V. DOMINION, EXHIBIT A-24

3.3   **Audio Tactile Device ("ATI").** The ATI connects to the ICX via the port located on the right side of the unit. A set of headphones connects directly to the ATI controller. Following the audio voting process using the ATI controller, the ICX-BMD printer produces a marked paper ballot which serves as the official ballot record.

3.4   **ImageCast Software.**   The Parties will enter into software licenses for the ImageCast software, substantially in the form of Exhibit B to this Agreement. The Dominion software includes, without limitation:

   3.4.1   AuditMark[1]. For each ballot that is scanned and accepted into the unit, a corresponding ballot image is created and stored for audit purposes. The image consists of two parts described below.

   • The top portion of the image contains a scanned image of the ballot.

   • The bottom portion consists of a machine-generated type-out showing each mark that the unit interpreted for that particular ballot. This is referred to as an AuditMark.

3.5   **Democracy Suite Software** is suite of election management software that supports all ImageCast voting channels from a single comprehensive database. The Democracy Suite EMS consists of the following components:

   3.5.1   Election Event Designer (EED). The EED Client Application is the primary application used for the definition and management of election event. EED is responsible for the definition of election projects. Each election project is represented as an instance of the election domain database with associated set of election project file based artifacts. The definition of the election project can be initiated by importing the election data through the Election Data Translator (EDT) module from external systems or by defining election project entities without importing external data.   It is important to note that an election project initiated through EDT can be further modified within the EED Client Application.   The system can generate two types of paper ballots:

   • Proofing ballots – ballots produced to allow election officials the ability to proof ballot content and styling. These ballots cannot be processed by the ImageCast as they don't have proper ballot barcodes. These ballots are overprinted with the text "Proofing Ballots – date/time"

   • Official ballots – represent production ready, press ready ballots in PDF format with barcodes and without any overprinting.

   3.5.2   Results Tally and Reporting (RTR). The RTR Client Application is the application used for the tally, reporting and publishing of election results.

   3.5.3   ImageCast Adjudication Application. The Adjudication application is a client and server application used to review and adjudicate ImageCast Central Scanner ballot images. The application uses tabulator results files and scanned images to allow election administrators to make adjudications to ballots with auditing and reporting capabilities. The Adjudication Application examines such voter exceptions as overvotes, undervotes, blank contests,

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[1] AuditMark is a registered trademark of Dominion Voting Systems Inc.

FULTON COUNTY V. DOMINION, EXHIBIT A-25

blank ballots, write-in selections, and marginal marks. The application works in two basic modes: election project setup and adjudication. The Adjudication Application can be used in a multi-client environment. Adjudication Application eliminates the need to physically rescan ballots, which can potentially damage the originals and cause chain-of-custody concerns.

3.5.4   Audio Studio.   The system uses Cepstral, a third-party text-to-audio synthesizer, to automatically generate audio ballots for the ImageCast X Ballot Marking Device. The County also has the option to import human-recorded audio, with or without the use of Audio Studio. Pronunciation may be modified using the Cepstral's Swifttalker application. The system outputs audio ballots (PNG images, SPX audio files and XML definition files), definition reports (XML, Excel or HTML files), and election definition files required to program the ImageCast X.

3.5.5   Automated Test Deck (ATD).   ATD is an application used to create test decks for running Pre-Logic and Accuracy Test with marking pattern requirements. The application can be used to access the election database and produce a set of print-ready PDFs and results tables for testing.

3.6   **Support and Implementation Services.**

3.7.1   Project Management Support.   Dominion will provide Project management support to oversee the general operations of the Project through the Agreement Term. The Project manager is responsible for arranging all meetings, visits and consultations between the parties and   for   all administrative matters such as invoices, payments and amendments. The Parties shall develop and finalize a Project implementation plan including a training and delivery schedule. The Parties agree that during the course of the implementation, changes to the Project schedule may be required. Any changes to the Project schedule must be mutually agreed to by both Parties and such agreement shall not be unreasonably withheld.

3.7.2   System Acceptance Testing Support.   Dominion will provide direct onsite training and support during the System Acceptance Testing period.

3.7.3   ImageCast X – This training introduces the ImageCast X system with an emphasis on the operation of the hardware. Students can expect to learn general operations, logic and accuracy testing, Election Day setup and operation, and troubleshooting.

3.7.4   ImageCast® ICC – This training introduces the ImageCast ICC with an emphasis on the operation of the hardware. Students can expect to learn general operations, logic and accuracy testing, ballot scanning operation, and troubleshooting. In addition, training will include resolution via the adjudication application.

3.7.5   EMS Server Installation, Configuration & Testing.   Dominion will provide a minimum total of one (1) day of direct onsite support for EMS Server installation, configuration & testing.

      3.7.6   <u>Democracy Suite EMS System</u> – Training covers defining an election project in Democracy Suite EED. Topics include importing jurisdictional information, ballot layout, proofing and printing, election file creation (ICX, and ICC), automated test deck creation, loading elections, tallying results (including adjudication tally), and generating reports.

      3.7.7   <u>On-Site Election Day Support.</u> Dominion will provide three (3) days (inclusive of travel) of direct onsite election support for two (2) elections.

3.8   ***Mobile Ballot Printing*** is an application used to search, preview and print ballots via a local printer device. The application makes use of ballot information and PDFs produced by the Election Event Designer application and information provided through the customer voter registration system.

3.9   ***Travel and Expenses included.*** All costs of Dominion transportation, lodging and meal expenses are included during the Agreement Term.

3.10   ***Ongoing telephone support.*** Telephone support shall be available for Customers during the Term of the Agreement at no additional costs.

3.11   ***Other Services, Consumables or Equipment.*** Any other services, consumables or equipment not specifically identified in this Agreement are available for purchase by the Customer at the then current Dominion list price.

FULTON COUNTY V. DOMINION, EXHIBIT A-27

AMENDMENT 2
TO THE VOTING SYSTEM AND MANAGED SERVICES AGREEMENT
BY AND BETWEEN
DOMINION VOTING SYSTEMS, INC.
AND FULTON COUNTY, PA

This Amendment 2 to the Voting Systems and Managed Services Agreement, is made and entered into as of this 15th day of February 2020 between Fulton County, PA ("Customer") and Dominion Voting Systems, Inc. ("Dominion").

RECITALS

WHEREAS, on April 1, 2019, the Customer and Dominion entered into a Voting Systems and Managed Services Agreement (the "Agreement"); and

WHEREAS, on September 15, 2019, the Customer and Dominion entered into Amendment 1 to the Voting Systems and Managed Services Agreement; and

WHEREAS, the Customer and Dominion now desire to amend the Agreement as described herein:

TERMS

NOW, THEREFORE, the parties amend the Agreement in accordance with the terms and conditions set forth below:

A.   **Incorporation of Recitals.** The above recitals are true and correct and incorporated herein by this reference as if fully set forth.

B.   **Exhibit A.**   The Customer and Dominion agree to delete the original Exhibit A of the Agreement and the amended Exhibit A from Amendment 1 to the Agreement in their entirety and replace it with the new Exhibit A attached hereto to this Amendment 2.

C.   **All Other Terms.** All other terms and provisions of the Agreement shall remain in full force and effect

FULTON COUNTY V. DOMINION, EXHIBIT A-28

IN WITNESS WHEREOF, the parties have caused this Amendment 2 to be executed as of the date first above written.

DOMINION VOTING SYSTEMS, INC.

_____
Authorized Signature
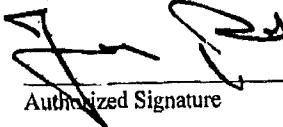
John Poulos
Name

President & CEO
Title

2/15/2020
Date

FULTON COUNTY, PA
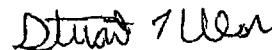
_____
Authorized Signature

Stuart Ulsh
Name

Commissioner
Title

2/11/20
Date

FULTON COUNTY V. DOMINION, EXHIBIT A-29

EXHIBIT A
VOTING SYSTEM AGREEMENT
BY AND BETWEEN DOMINION VOTING SYSTEMS
AND FULTON COUNTY, PA

PRICING SUMMARY AND DELIVERABLES DESCRIPTION

1. Pricing/Payment Summary and Descriptions

   1.1 **Pricing and Payment Summary.** The total amount of the managed service contract pricing shall equal **$320,483.00** for a total of eight (8) years. The following is the invoicing schedule for the annual Customer payments. The Customer shall pay invoices in a timely manner and no later than thirty (30) calendar days from receipt of a Dominion invoice. All payments shall be made is in U.S. Dollars. Pricing does not include shipping or any applicable taxes.

   1.1.1 Year 1 shall cover the time period from the Agreement Effective Date through December 31, 2019. The Year 1 invoice of **$33,028.00** will be issued immediately after System certification by the State of Pennsylvania. Under no circumstance will payment be made by the Customer until the System is certified for use by the State of Pennsylvania and all Acceptance testing has been completed to the satisfaction of Customer.

   1.1.2 Year 2: 1/1/2020 – 12/31/2020: **$41,065.00** invoice will be issued on 1/1/2020

   1.1.3 Year 3: 1/1/2021 – 12/31/2021: **$41,065.00** invoice will be issued on 1/1/2021

   1.1.4 Year 4: 1/1/2022 – 12/31/2022: **$41,065.00** invoice will be issued on 1/1/2022

   1.1.5 Year 5: 1/1/2023 – 12/31/2023: **$41,065.00** invoice will be issued on 1/1/2023

   1.1.6 Year 6: 1/1/2024 – 12/31/2024: **$41,065.00** invoice will be issued on 1/1/2024

   1.1.7 Year 7: 1/1/2025 – 12/31/2025: **$41,065.00** invoice will be issued on 1/1/2025

   1.1.8 Year 8: 1/1/2026 – 12/31/2026: **$41,065.00** invoice will be issued on 1/1/2026

2. System Description - Prices of equipment, technical facilities, software, and other related services for voting, vote counting, and result processing.

DESCRIPTION	QTY
Central Scanning Solution: Absentee / Central Count	
ImageCast Central Kit: Canon G1130: Includes Canon Model DR-G1130, Computer w/ 23" Monitor, Keyboard & Mouse, One 8GB USB Flash Drive & One I-Button, patch cable	2
In-Person Voting Solution: Polling Location Hardware	
ImageCast X BMD (21 Inch) Kit includes: ICX Firmware, Tablet, 5 voter activation cards, printer, cables, power cord	15
Mobile Ballot Printing Kit -- Laser Printer, Laptop, cables	1
Universal Power Supply (UPS) for ICX BMD	15
Audio Tactile Interface (ATI) Accessible Unit	15
ImageCast X Voting Booth - Standard	12
ICX Prime BMD Bag Kit	15

FULTON COUNTY V. DOMINION, EXHIBIT A-30

Election Management Hardware	
Democracy Suite EMS Express Server Configuration Kit - Up to 7 clients	1
EMS Client Workstation Configuration Kit	1
Adjudication Workstation Kit	1
Software Licenses	
Democracy Suite (EMS) Application	1
ICC Adjudication Application	1
Automated Test Decks Application	1
Mobile Ballot Printing Application	1
Support and Implementation Services	#
Project Management	5
Training	5
On-Site Election Support (3 days for each Election)	2

3. Detailed Descriptions

    3.1 **ImageCast Central Scanner (ICC).** Each ImageCast Central Scanner includes the following components:

        3.1.1 Canon DR-G1130 high speed document scanner

        3.1.2 ImageCast Central Software

        3.1.3 Workstation with pre-loaded software

        3.1.4 iButton Security Key

        3.1.5 iButton Programmer and iButton Key Switch & Cat5 RJ 45 Cables used with Democracy Suite to transfer security and election information to the iButtons for use with the ICC.

    3.2 **ImageCast® X ("ICX").**

        3.2.1 <u>Application:</u> ImageCast X BMD is a touchscreen in-person voting device and ballot marking device. Voting sessions are initiated on the tablet by either a smart card or the entry of a numeric code based on activation. The ballot is loaded directly onto the standalone device. All voting activity is performed at the tablet, including accessible voting. Accessible voting interfaces connect to the tablet via an Audio Tactile Interface or ATI. After the voter reviews the ballot selections, a paper ballot is created for the voter from a printer in the voting booth. The printed ballot contains a written summary of the voter's choices, as well as a 2D barcode which is read by Dominion's ImageCast Precinct tabulator. No votes are stored on the ImageCast X-BMD unit. All votes can be tabulated and stored both the ImageCast Precinct Tabulators.

        3.2.2 <u>Components:</u> ImageCast X BMD is composed of a 21" Avalue touchscreen, Android OS 4.4.4, DC 19V input, HP LaserJet Pro M402dne laser printer, 6' cable. 5 smart cards, and 8GB flash drive.

FULTON COUNTY V. DOMINION, EXHIBIT A-31

3.3 **_Audio Tactile Device ("ATI")._** The ATI connects to the ICX via the port located on the right side of the unit. A set of headphones connects directly to the ATI controller. Following the audio voting process using the ATI controller, the ICX-BMD printer produces a marked paper ballot which serves as the official ballot record.

3.4 **_ImageCast Software._** The Parties will enter into software licenses for the ImageCast software, substantially in the form of Exhibit B to this Agreement. The Dominion software includes, without limitation:

3.4.1 AuditMark[1]. For each ballot that is scanned and accepted into the unit, a corresponding ballot image is created and stored for audit purposes. The image consists of two parts described below.

- The top portion of the image contains a scanned image of the ballot.

- The bottom portion consists of a machine-generated type-out showing each mark that the unit interpreted for that particular ballot. This is referred to as an AuditMark.

3.5 **_Democracy Suite Software_** is suite of election management software that supports all ImageCast voting channels from a single comprehensive database. The Democracy Suite EMS consists of the following components:

3.5.1 Election Event Designer (EED). The EED Client Application is the primary application used for the definition and management of election event. EED is responsible for the definition of election projects. Each election project is represented as an instance of the election domain database with associated set of election project file based artifacts. The definition of the election project can be initiated by importing the election data through the Election Data Translator (EDT) module from external systems or by defining election project entities without importing external data. It is important to note that an election project initiated through EDT can be further modified within the EED Client Application. The system can generate two types of paper ballots:

- Proofing ballots – ballots produced to allow election officials the ability to proof ballot content and styling. These ballots cannot be processed by the ImageCast as they don't have proper ballot barcodes. These ballots are overprinted with the text "Proofing Ballots – date/time"

- Official ballots – represent production ready, press ready ballots in PDF format with barcodes and without any overprinting.

3.5.2 Results Tally and Reporting (RTR). The RTR Client Application is the application used for the tally, reporting and publishing of election results.

3.5.3 ImageCast Adjudication Application. The Adjudication application is a client and server application used to review and adjudicate ImageCast Central Scanner ballot images. The application uses tabulator results files and scanned images to allow election administrators to make adjudications to ballots with auditing and reporting capabilities. The Adjudication Application examines such voter exceptions as overvotes, undervotes, blank contests,

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[1] AuditMark is a registered trademark of Dominion Voting Systems Inc.

FULTON COUNTY V. DOMINION, EXHIBIT A-32

blank ballots, write-in selections, and marginal marks. The application works in two basic modes: election project setup and adjudication. The Adjudication Application can be used in a multi-client environment. Adjudication Application eliminates the need to physically rescan ballots, which can potentially damage the originals and cause chain-of-custody concerns.

3.5.4   Audio Studio.   The system uses Cepstral, a third-party text-to-audio synthesizer, to automatically generate audio ballots for the ImageCast X Ballot Marking Device. The County also has the option to import human-recorded audio, with or without the use of Audio Studio. Pronunciation may be modified using the Cepstral's Swifttalker application. The system outputs audio ballots (PNG images, SPX audio files and XML definition files), definition reports (XML, Excel or HTML files), and election definition files required to program the ImageCast X.

3.5.5   Automated Test Deck (ATD).   ATD is an application used to create test decks for running Pre-Logic and Accuracy Test with marking pattern requirements. The application can be used to access the election database and produce a set of print-ready PDFs and results tables for testing.

3.6   **Support and Implementation Services.**

3.7.1   Project Management Support.   Dominion will provide Project management support to oversee the general operations of the Project through the Agreement Term.   The Project manager is responsible for arranging all meetings, visits and consultations between the parties and   for   all administrative matters such as invoices, payments and amendments. The Parties shall develop and finalize a Project implementation plan including a training and delivery schedule.   The Parties agree that during the course of the implementation, changes to the Project schedule may be required.   Any changes to the Project schedule must be mutually agreed to by both Parties and such agreement shall not be unreasonably withheld.

3.7.2   System Acceptance Testing Support.   Dominion will provide direct onsite training and support during the System Acceptance Testing period.

3.7.3   ImageCast X – This training introduces the ImageCast X system with an emphasis on the operation of the hardware. Students can expect to learn general operations, logic and accuracy testing, Election Day setup and operation, and troubleshooting.

3.7.4   ImageCast® ICC – This training introduces the ImageCast ICC with an emphasis on the operation of the hardware. Students can expect to learn general operations, logic and accuracy testing, ballot scanning operation, and troubleshooting. In addition, training will include resolution via the adjudication application.

3.7.5   EMS Server Installation, Configuration & Testing.   Dominion will provide a minimum total of one (1) day of direct onsite support for EMS Server installation, configuration & testing.

3.7.6   <u>Democracy Suite EMS System</u> – Training covers defining an election project in Democracy Suite EED. Topics include importing jurisdictional information, ballot layout, proofing and printing, election file creation (ICX, and ICC), automated test deck creation, loading elections, tallying results (including adjudication tally), and generating reports.

3.7.7   <u>On-Site Election Day Support.</u> Dominion will provide three (3) days (inclusive of travel) of direct onsite election support for two (2) elections.

3.8   ***Mobile Ballot Printing*** is an application used to search, preview and print ballots via a local printer device. The application makes use of ballot information and PDFs produced by the Election Event Designer application and information provided through the customer voter registration system.

3.9   ***Travel and Expenses included.*** All costs of Dominion transportation, lodging and meal expenses are included during the Agreement Term.

3.10   ***Ongoing telephone support.*** Telephone support shall be available for Customers during the Term of the Agreement at no additional costs.

3.11   ***Other Services, Consumables or Equipment.*** Any other services, consumables or equipment not specifically identified in this Agreement are available for purchase by the Customer at the then current Dominion list price.

EXHIBIT B

CERTIFICATION REPORT CONCERNING
EXAMINATION RESULTS FOR DOMINION
DEMOCRACY SUITE 5.5A WITH IMAGE CAST
BALLOT MARKING DEVICE (ICX-BMD),
JANUARY 17, 2019

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF STATE

REPORT CONCERNING THE EXAMINATION RESULTS OF DOMINION VOTING SYSTEMS DEMOCRACY SUITE 5.5A WITH IMAGECAST® X BALLOT MARKING DEVICE (ICX-BMD), IMAGECAST PRECINCT OPTICAL SCANNER (ICP), IMAGECAST CENTRAL STATION (ICC), AND DEMOCRACY SUITE EMS (EMS)
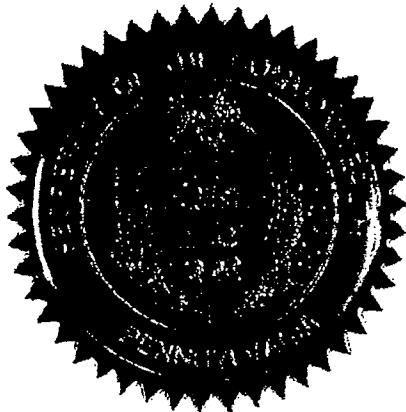
Issued By:

Kathy Boockvar
Acting Secretary of the Commonwealth
January 17, 2019

EXAMINATION RESULTS OF DOMINION VOTING SYSTEMS DEMOCRACY SUITE 5.5A WITH IMAGECAST® X BALLOT MARKING DEVICE (ICX-BMD), IMAGECAST PRECINCT OPTICAL SCANNER (ICP), IMAGECAST CENTRAL STATION (ICC), AND DEMOCRACY SUITE EMS (EMS)

I.   Introduction

Article XI-A of the Pennsylvania Election Code, 25 P.S. §§ 3031.1 *et seq.,* authorizes the use of electronic voting systems. Section 1105-A of the Pennsylvania Election Code, 25 P.S. § 3031.5, requires that the Secretary of the Commonwealth (Secretary) examine all electronic voting systems used in any election in Pennsylvania and that the Secretary make and file a report stating whether, in his opinion, the electronic voting system can be safely used by voters and meets all applicable requirements of the Election Code.

Upon the request of Dominion Voting Systems Inc. (Dominion), the Department of State's Bureau of Commissions, Elections and Legislation (Department) scheduled an examination for October 15, 2018 of the Democracy Suite 5.5 voting system. The voting system presented for certification in Pennsylvania included the Democracy Suite Election Management System (EMS) election management software used in conjunction with the following components: 1) ImageCast® X (ICX) Ballot Marking Device (BMD), a ballot marking device with Commercial Off The Shelf (COTS) printer, HP LaserJet Pro Printer M402dn/HP LaserJet Pro Printer M402dne, for printing marked ballots; 2) ImageCast Precinct Scanner (ICP), a precinct optical scan ballot tabulator that scans, validates and tabulates hand-marked paper ballots and ballots produced on the BMD; and 3) ImageCast Central Station (ICC), a ballot scanning and tabulating system that can be configured with high speed COTS scanners Canon Image Formula DR-G1130 /Canon Image Formula DR-M160-II to tabulate ballots in central office.

The Secretary appointed SLI Global Solutions (SLI) and the Center for Civic Design (CCD) as professional consultants to conduct the examination of Democracy Suite 5.5. The examination process included a public demonstration and functional examination (functional examination), accessibility examination and security testing. The functional and accessibility examinations were performed in Room G24A/B of the Commonwealth Capitol

2

Complex - Finance Building, 613 North Street, Harrisburg, PA 17120. Mike Santos, Senior Test Manager, and Kyle Johnson, Senior Test Engineer (Functional Examiner), of SLI Global Solutions, conducted the functional examination of the Democracy Suite 5.5 pursuant to Section 1105-A(a) of the Election Code, 25 P.S. § 3031.5(a). Whitney Quesenbery, Denis Anson and Michael Weisman (Accessibility Examiner), representing CCD, performed an accessibility examination of the Democracy Suite 5.5 system. The examinations commenced on October 15, 2018, and lasted approximately four days. Jonathan Marks, Commissioner of the Bureau of Commissions, Elections and Legislation; Kathryn Boockvar, Senior Advisor to the Governor on Election Modernization; Jessica Myers, Deputy Director, Office of Policy; Kathleen Kotula, Executive Deputy Chief Counsel, Office of Chief Counsel; and Sindhu Ramachandran, Voting Systems Analyst, represented the Secretary of the Commonwealth. Jessica Bowers, Director of Certification, and Matt Coffey, Systems Specialist, represented Dominion. Additional staff members from the Department also attended the examination. The functional examination was open to the public and was videotaped by Department staff. Security testing of the Democracy Suite 5.5 system was performed at SLI facilities located at 4720 Independence Street, Wheat Ridge, Colorado, prior to the functional examination. Mike Santos, Senior Test Manager, and Jesse Peterson, Security Specialist, at SLI Global Solutions, served as the Security Examiner for the Democracy Suite 5.5 security testing. The Functional Examiner and Accessibility Examiner concluded that the Democracy Suite 5.5 did not comply with Sections 1107-A(10) and (15), 25 P.S. §§ 3031.7(10) & (15), of the Pennsylvania Election Code because the ICX BMD did not allow the voter to remove all candidate selections in a contest after voting straight party and the screen referenced the process of marking and printing the ballot as "casting" the ballot. Additionally, the Security Examiner noted that the system hardening measures documented in the Technical Data Package (TDP) required additional modifications for a secure implementation.

Thereafter, Dominion incorporated corrections for the issues identified during the Democracy Suite 5.5 examination, and re-submitted the new release, Democracy Suite 5.5A, to both the U.S. Election Assistance Commission (EAC) for federal approval and the

3

Department for state certification. The system components remained the same and the only change in the new release was the software enhancements to remediate the identified anomalies. The Functional Examiner performed a follow-up examination of Democracy Suite 5.5A on December 5-6, 2018, at SLI Global Solutions located at in Wheat Ridge, Colorado. Department staff observed the examination via web conference. The examination was videotaped by SLI and the video is on file at the Department. The Security Examiner validated that the documentation has been updated to reflect accurate system hardening steps for a secure implementation. Since the software changes made to the Democracy Suite 5.5A system were specifically to remediate the identified anomalies in Democracy Suite 5.5, it was determined that the results of the accessibility examination and security testing conducted as part of the Democracy Suite 5.5 examination may be utilized for Democracy Suite 5.5A certification. The Department discussed the software modifications with the Accessibility Examiner, since both the straight party usability issue and usage of the word "cast" were also part of the Accessibility test findings.

II.   The Democracy Suite 5.5A Voting System

Democracy Suite 5.5A components considered for use in Pennsylvania[1] provide a paper-based voting system with end-to-end election support, from defining an election to generating final reports. The system is comprised of both precinct and central count tabulators, and BMDs as the ADA component. The system components include: the Election Management System (EMS), the ImageCast Central (ICC) - utilizing two Commercial Off the Shelf (COTS) scanners, the ImageCast Precinct (ICP) optical scanner and the ImageCast X (ICX) (Prime and Classic) ballot marking devices.

The following is a description of the Democracy Suite 5.5A components summarized from Section 2.0 (System Overview) of the Test Report for Examination of Democracy Suite 5.5A, prepared by the Functional Examiner and documentation submitted by

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[1] The EAC certified system includes a DRE option for the ICX device which is not considered for certification in Pennsylvania.

Dominion as part of the Technical Data Package (TDP).

Election Management System (EMS)

The Dominion Democracy Suite 5.5A EMS supports elections on the ICX Prime, ICX Classic, ICP and ICC systems. The EMS set of applications are responsible for all pre-voting and post-voting groups of activities in the process of defining and managing elections. EMS software platform consists of end-user (client) and back-end (server) applications. The EMS platform consists of the following major components.

EMS Election Event Designer (EED) - Supports pre-voting activities including election definition together with ballot styling capabilities.

EMS Audio Studio (AS) - End-user helper application used to record audio files for a given election project utilized during the pre-voting phase of the election cycle.

EMS Application Server – Server-side application responsible for executing long running processes, such as rendering ballots, generating audio files and election files, etc.

EMS Results Tally and Reporting (RTR) - Integrates election results acquisition, validation, tabulation, reporting, and publishing capabilities and represents a main post-voting phase end-user application.

EMS File System Service (FSS) - Stand-alone service that runs on client machines, enabling access to low level operating system API for partitioning CF cards, reading raw partition on ICP CF card, etc.

EMS Data Center Manager (DCM) - End-user application used to export election data from election project and import election data into election project.

EMS Election Data Translator (EDT) - End-user application used to export election data from election project and import election data into election project.

EMS Adjudication (ADJ) and EMS Adjudication Service - Server and client components responsible for adjudication, including reporting and generation of adjudicated

5

result files from ImageCast Central tabulators and adjudication of write-in selections from ImageCast Precinct and Image Cast Central tabulators.

ImageCast Voter Activation (ICVA) - Installed on a workstation or laptop at the polling place, that allows the poll workers to program smart cards for voters. The smart cards are used to activate voting sessions on ImageCast X.

ImageCast X (ICX) Ballot Marking Device (BMD)

The ICX ballot marking platform is used for creation of paper cast vote records. These ballots can be scanned, reviewed, cast and tabulated at the polling location on an ICP or later scanned and tabulated by the ICC at a central location. The ICX consists of two models, ICX Prime and ICX Classic.

2.3   ImageCast Precinct (ICP)

The ICP is a hybrid precinct optical scan ballot counter designed to provide ballot scanning, ballot review and tabulation at a polling place.

2.4   ImageCast Central (ICC) Count Scanner

The ICC is a high-speed, central ballot scan tabulator based on Commercial off the Shelf (COTS) hardware, coupled with the custom-made ballot processing application software. It is used for high speed scanning and counting of paper ballots.

Manufacturer Software/Firmware

The **Dominion Democracy Suite 5.5A** voting system consists of the following software and firmware components:

Application	Version
EMS Election Event Designer (EED)	5.5.12.1
EMS Results Tally and Reporting (RTR)	5.5.12.1
EMS Application Server	5.5.12.1
EMS File System Service (FSS)	5.5.12.1
EMS Audio Studio (AS)	5.5.12.1
EMS Data Center Manager (DCM)	5.5.12.1

Application	Version
EMS Election Data Translator (EDT)	5.5.12.1
ImageCast Voter Activation (ICVA)	5.5.12.1
EMS Adjudication	5.5.8.1
EMS Adjudication Service	5.5.8.1
Smart Card Helper Service	5.5.12.1
ImageCast Precinct	5.5.3-0002
ImageCast Central	5.5.3.0002
ImageCast X	5.5.10.30

COTS Software/Firmware

Additional COTS software and firmware included in the system has been defined as part of the EAC system certification scope that will be added to this report as Attachment A once the final certification is granted for Democracy Suite 5.5A.

III.   EXAMINATION APPROACH, PROCEDURES AND RESULTS

A.   Examination Approach

To ascertain whether Democracy Suite 5.5A can be safely used by voters at elections in the Commonwealth and meets all the requirements of the Pennsylvania Election Code, the Examiners developed test protocols for the examination. The initial functional examination of Democracy Suite 5.5 held October 15 through 19, 2018, determined that the system did not comply with Sections 1107-A(10) and (15), 25 P.S. §§ 3031.7 (10) & (15). The Examiners observed the following issues:

1. The ICX-BMD did not allow a voter to deselect all choices in a contest after voting straight party when the voter attempted to do so. Instead, a warning message that required no user acknowledgment displayed above the contest indicating that their "implicit" straight party selections would remain in effect. The screen presented to the voter had all the selections deselected and when the voter printed the ballot, the paper ballot indicated votes for the candidates chosen by the straight party option.

7

The warning message wording did not clearly indicate the intent. Also, the message displayed was not intuitive enough for a voter to notice it and there was no acknowledgment action required of the voter indicating that the message was seen.

2. The ICX-BMD final screen presented to the voter indicated that the voter was about to cast their ballot, even though the voter was only printing the ballot which needs to be further scanned by the ICP or ICC.

Dominion remediated the software issues and the Examiners then performed a follow-up examination of Democracy Suite 5.5A to confirm that the anomalies identified in Democracy Suite 5.5 were corrected and the system complies with all the requirements of the Pennsylvania Election Code. The examination approach followed for Democracy Suite 5.5 and Democracy Suite 5.5A is discussed in the below sections.

Democracy Suite 5.5 Examination Approach

Functional Examination

The test protocols separated the requirements of Article XI-A of the Pennsylvania Election Code, Sections 1101-A to 1122-A, 25 P.S. §§ 3031.1 - 3031.22, into six main areas of test execution: (1) Source Code Review; (2) Documentation Review; (3) System Level Testing; (4) Security/Penetration Testing; (5) Privacy Analysis; and (6) Usability Analysis.

Source Code Review was performed prior to the functional examination to determine if there were any vulnerabilities found that would warrant additional security examination.

Documentation Review was performed to verify that the portions of the Pennsylvania Election Code, which reference documentation detail, are sufficiently met by the Dominion Democracy Suite 5.5 documentation. The Functional Examiner validated compliance of the system to the following sections of the Election Code during the documentation review.

- 1105-A(a), 25 P.S. § 3031.5(a), requiring that an electronic voting system has been examined and approved by a federally recognized ITA;

- 1107-A(11), 25 P.S. § 3031.7(11), requiring an electronic voting system to be suitably designed in terms of usability and durability, and capable of absolute

accuracy;

- 1107-A(13), 25 P.S. § 3031.7(13), requiring an electronic voting system to correctly tabulate every vote;

- 1107-A(14), 25 P.S. § 3031.7(14), requiring an electronic voting system to be safely transportable; and

- 1107-A(15), 25 P.S. § 3031.7(15), requiring an electronic voting system to be designed so voters may readily understand how it is operated.

System Level Analysis examined the Dominion Democracy Suite 5.5 voting system by conducting an election starting with creating an election definition using EMS and then creating the election media needed to populate the voting devices (the ICX - Classic and Prime with COTS printer HP LaserJet Pro Printer M402dn, ICP, ICC with COTS scanners - Canon DR-G1130 and Canon DR-M160-II). Ballots were marked, manually as well as via both models (Classic and Prime) of the ICX ballot marking device, and tabulated through the ICP and ICC (both COTS scanners). The results reports were validated against the expected results of the voted ballots. All components of the Democracy Suite 5.5 system were exercised to verify that they met all pertinent requirements of the Pennsylvania Election Code. The test cases were designed to ascertain compliance with the following sections of the Election Code:

- 1101-A, 25 P.S. § 3031.1, requiring an electronic voting system to provide for a permanent physical record of all votes cast;

- 1107-A(2), 25 P.S. § 3031.7(2), requiring an electronic voting system to permit voting on both candidates and ballot questions, according to the official ballot;

- 1107-A(3), 25 P.S. § 3031.7(3), requiring an electronic voting system to permit straight party voting, including the "Pennsylvania method" of straight party voting;

- 1107-A(4), 25 P.S. § 3031.7(4), requiring an electronic voting system to permit a voter to vote for candidates of all different parties, and write-in candidates;

- 1107-A(5), 25 P.S. § 3031.7(5), requiring an electronic voting system to permit a voter to enter write-in votes;

- 1107-A(6), 25 P.S. § 3031.7(6), requiring an electronic voting system to permit a voter to cast votes for candidates and ballot questions he or she is entitled to

9

vote for, and prevents a voter from casting votes the voter is not entitled to vote on;

- 1107-A(7), 25 P.S. § 3031.7(7), requiring an electronic voting system to prevent over-votes;

- 1107-A(8), 25 P.S. § 3031.7(8), requiring an electronic voting system to prevent a person from casting more than one vote for a candidate or question, except where this type of cumulative voting is permitted by law;

- 1107-A(9), 25 P.S. § 3031.7(9), requiring an electronic voting system to permit voters to vote in their own parties' primaries, and prevents them from voting in other parties' primaries, while also permitting voters to vote for any nonpartisan nomination or ballot question they are qualified to vote on; and

- 1107-A(10), 25 P.S. § 3031.7(10), requiring an electronic voting system that registers votes electronically to permit voters to change their votes up until taking the final step to register the vote, and for systems that use paper ballots or ballot cards, permits a voter to get a new ballot in the case of a spoiled ballot, and to mark and cancel the spoiled ballot;

- Parts of 1107-A(16), 25 P.S. § 3031.7(16), requiring an electronic voting system which provides for district-level tabulation to include (i) a public counter to register how many ballots are submitted to be counted; (iv) will not tabulate an over-vote, with an option to notify a voter of an over-vote if used during voting hours; and (v) generates a printed record that counters are set to zero before voting commences; and

- Parts of 1107-A(17), 25 P.S. § 3031.7(17), requiring an electronic voting system which provides for central-count tabulation to (ii) preclude tabulation of an over-vote; and (iii) indicate that counters are set to zero before processing ballots, either by district or with the capability to generate cumulative reports.

The Functional Examiner also used the System Level Testing to further evaluate the design and accuracy aspects of the system as required by Sections 1107-A(11) and (13), 25 P.S. §§ 3031.7(11) & (13), through his use at public demonstration, in addition to the requirements being validated in the documentation review phase by reviewing EAC certification reports.

The Security/Penetration Analysis examined the voting system's compliance with the requirements of the Pennsylvania Election Code by analyzing physical security procedures and impoundment of ballots. Precinct tabulation devices were installed for delivery to the precinct, and the Functional Examiner analyzed the pertinent security procedures performed

10

on each device to ascertain compliance with Section 1107-A(12), 25 P.S. § 3031.7(12), requiring an electronic voting system to provide acceptable ballot security procedures and impoundment of ballots to prevent tampering with or substitution of any ballots or ballot cards. The Functional Examiner also used the security analysis phase of testing to validate compliance with parts of Sections 1107-A(16) and (17), 25 P.S. §§ 3031.7(16) & (17), that relates to system security.

The Privacy Analysis examined the voting system's compliance with Section 1107-A(l) of the Election Code, 25 P.S. § 3031.7(1), requiring that an electronic voting system provide for absolute secrecy of the vote, by analyzing how the polling place devices met the pertinent privacy requirements.

The Usability Analysis evaluated the compliance of the voting system with Sections 1107-A(14) and (15), 25 P.S. § 3031.7(14) & (15). The results from the tests were used by the Functional Examiner to supplement his conclusions from the documentation review phase.

Accessibility Examination

The accessibility examination was designed to provide insights about each voting system's usability and accessibility especially for voters with disabilities, as well as how effectively the system could be deployed by poll workers and voters. The Accessibility Examination included a team of three examiners with accessibility, usability and election process experience, collectively referred as Accessibility Examiner. The examination process was divided into three parts:

- **Expert review** by the Accessibility Examiner, using scenarios based on personas of people with disabilities from National Institute of Standards and Technology (NIST) and their professional experience.

- **Voters with disabilities used** the system voting a reasonable length PA ballot and completed a questionnaire about their experience. The Accessibility Examiner observed and made notes.

11

- **Election officials and poll workers tested the accessibility features** to evaluate how they would be activated during an election. They commented on the system based on their experience.

The testing team determined the test ballot parameters and constructed a typical PA ballot, with a mix of contest types and variation in the number of candidates to be voted for each contest. The ballot contained 14 contests: 1 straight party contest, 1 vote for a pair (President/Vice President), 7 vote for one, 2 vote for not more than three, 1 vote for not more than five, 1 referendum contest and 1 retention contest. The facilitator instructed voters on the vote selections to be made, so that results could be compared between each session and different examinations.

Security Testing

The Security testing provided a means to assess the required security properties of the voting system under examination and ascertain compliance with PA Election Code requirements, including 25 P.S. §§ 3031.7(11), (12), (16) and (17). The security tests were based on the PA Voting System Security Standard, published as Attachment E to the Directive for Electronic Voting Systems. The Security Examiner conducted tests that covered the following areas of testing - documentation review, design, software security, network capabilities, audit logging, physical security and penetration testing.

Democracy Suite 5.5A Examination Approach

Democracy Suite 5.5A is a release to correct the anomalies noted in Democracy Suite 5.5 system. The examiners evaluated the changes submitted by Dominion and developed test protocols to validate the modifications to Democracy Suite 5.5 to ensure that the fixes

resolved the identified anomalies and that the modified system maintained compliance with all the PA Election Code requirements.

Functional Examination

The Functional Examiner and Department agreed that the test approach must include Documentation Review, Source Code Review, System Level Testing and Usability Analysis. Security/Penetration and Privacy analysis results were leveraged from Democracy Suite 5.5 examination since those aspects of the system remained unaffected by the isolated code changes made to the system.

Documentation review was performed to verify that the portions of the Pennsylvania Election Code, which reference documentation detail, are sufficiently met by the Dominion Democracy Suite 5.5A documentation. Source code review was done to determine if there were any vulnerabilities that warranted additional testing and the review focused on source code modifications for the Democracy Suite 5.5A release. System Level Testing examined Democracy Suite 5.5A by conducting a general election and closed primary election. The election runs were to (a) test and confirm that the anomalies identified during Democracy Suite 5.5 examination were remediated, and (b) to perform regression testing of all components of the system. The election runs allowed the Functional Examiner to ascertain that the compliance with the Election Code requirements determined during the System Level Testing of Democracy Suite 5.5 is maintained in the new release. Usability analysis was performed to verify that the usability concerns identified during the examination of Dominion Democracy Suite 5.5 is remediated in the new release.

Security Testing

The Department of State in consultation with the Security Examiner decided that the test approach must include only validating the documentation updates to ensure secure

13

implementation of the system components, since the isolated code changes did not affect the security aspects of the system.

Accessibility Examination

The Department of State, in consultation with the Accessibility Examiner, decided that the findings from Democracy Suite 5.5 Accessibility Examination can be used for Democracy Suite 5.5A, since there were no hardware changes and the isolated code changes were for correcting the anomalies identified during Democracy Suite 5.5. The Department discussed the software changes done for the ICX with the Accessibility Examiner, since Accessibility testing also reported the same usability concerns identified during Functional Examination.

B.   Examination Process and Procedures

The examination process and procedures followed for the Democracy Suite 5.5 and Democracy Suite 5.5A examinations are listed in the sections below. The final determination in this report is based on the combined analysis of the results and conclusions from both examinations.

Democracy Suite 5.5 Examination

Functional Examination

The public demonstration and functional examination portion commenced on October 15, 2018, at Room G24A/B of the Commonwealth Capitol Complex - Finance Building, 613 North Street, Harrisburg, PA 17120. The test execution tasks took approximately four days. Members of the public were allowed as observers for the examination. The Functional Examiner performed System Level Testing, Security/Penetration Testing and Privacy and Usability Analysis during the examination. Source code and Documentation review were completed prior to the public examination at SLI lab facilities in Wheat Ridge, Colorado.

Dominion supplied all the hardware equipment required for the examination. All

14

software and firmware necessary to perform the examination was received directly from the Voting System Test Laboratories (VSTL) that tested the voting system for EAC certification. The trusted build of the software and firmware for each device being evaluated were installed using the appropriate media for installation. The hash codes for all system components were captured using the process listed in the manufacturer's Technical Data Package (TDP) by the Functional Examiner with assistance from Dominion representative. The Functional Examiner further compared and confirmed that all the captured hash codes matched the hash codes for the EAC certified system executables before executing the test scripts.

The Functional Examiner created the election definition using EMS – EED and transport media was created to populate the devices under examination with the election. The polling place was set up using ICP and ICX - BMD (Classic and Prime). A primary and general election were then run using polling place devices and central scanners. Ballots were tabulated at the polling place using ICP and ICC using scanners Canon imageFormula DR-G1130 and Canon imageFormula DR-M160II. Results were then tabulated using EMS and validated against expected results.

Accessibility Examination

The accessibility examination portion commenced on October 15, 2018, at Room G24A/B of the Commonwealth Capitol Complex - Finance Building. The examination lasted approximately three days followed by a debrief meeting on October 18, 2018, with DOS and CCD to discuss initial findings. The examination included expert review by the Accessibility Examiner, sessions with four poll worker groups, and sessions with six voters with disabilities using different accessible devices for voting. The voter sessions each took approximately an hour. The poll worker sessions took approximately one hour to 90 minutes each. Dominion supplied the hardware and supplies for the Accessibility Examination. The equipment was prepared for the examination by loading the required election definition using transport media. This test examined the Dominion Voting ImageCast X (ICX) touch screen ballot marking device with COTS printer HP LaserJet Pro Printer M402dne and the

15

ImageCast Precinct Optical Scanner (ICP).

The typical accessible voting experience involves the voter making selections on the ICX to mark their ballot, printing their ballot using a separate printer, and then scanning their printed ballot on the ICP to cast the ballot. The Accessibility Examiner identified the accessibility features of each component as listed below:

ICX accessibility features:

- ADA compliant voting booth
- Touch screen, in portrait orientation
- Audio ballot with two voices: a prerendered, tactile keypad instructions voice and a ballot content, text-to-speech voice
- Tactile key pad with different-shaped, braille encoded buttons
- Binary input/Dual switch jack (on tactile key pad)
- Audio output jack
- Dual switch "jelly bean" buttons
- Sip-and-puff device, mountable to the table with adjustable arm
- Voter settings:

  - Language choice
  - Audio volume and tempo changes
  - Text Size (default, "Big")
  - Screen contrast options: color, white background with black text, and black background with white text
  - Screen blank, while using the audio only

ICP scanner features

The ICP scanner had no notable accessibility features.

The machine features listed above are not exhaustive. For more information about the Dominion Democracy Suite 5.5 system, refer to the vendor provided technical specifications.

The Accessibility Examiner prepared voting scenarios for each voting session to

16

allow comparison of results between each session. Both the ballot contents and the instructions for marking the ballot were designed to exercise different types of interactions (navigation in ballot, navigation in contest, undervotes, overvotes, straight party, navigation within the review/summary screen, making changes to a contest from the review/summary screen). The ballot included both very short contests, and those long enough to potentially fill more than one screen, even at the default text size.

The Accessibility Examination does not produce a typical voting session, but it provides a structured opportunity to explore how the voting system works in all interaction modes including:

- Visual display mode with default settings and use of enhanced options for text size, brightness, and contrast
- Audio format with options for volume and tempo
- Touch input and navigation on the display screen
- Input and navigation using a tactile keypad
- Input and navigation using a dual switch

Expert Review by Accessibility Examiner

The Accessibility Examiner used the same ballot and instructions to be used for voter and poll worker review, for their expert review, so they would be familiar with the interaction voters would experience.

Sessions with voters

Each voter session took about an hour. They included:

- An opening interview about their previous voting experience and the types of assistive technologies they use in daily life and in voting.
- A very basic orientation to the system with opportunities for voters to ask questions about any assistive technologies available.

17

- Set-up of the machine using the provided assistive access features based on the needs of the individual voter. Where a blind voter would typically use the provided or personal headset to listen to the audio instructions, the tests used an external speaker so that the testers could inquire about the voters understanding of the instructions.

- Voting a ballot following facilitator-guided voting instructions, and facilitator help only where necessary. Voters were encouraged to give feedback about their experiences, both positive and negative, as they went through the ballot. The Accessibility Examiner and the voters discussed any feedback and questions that occurred during the voting sessions and re-evaluated any findings as necessary.

- A closing interview including a questionnaire about their voting experience and reactions to the system.

Sessions with poll worker groups

Each poll worker session took approximately an hour and a half, depending on the group size and provided the most activity variability. Each session included:

- A brief orientation to the voting systems and the accessibility features, similar to a poll worker training.

- An opportunity for the poll workers to review vendor-provided instructions before trying the system. They marked ballots and experimented with the accessibility features.

- An opportunity for the poll workers to interact with two to three different access-needs scenarios, depending on the size of the group and available time. Each scenario involved an examiner role-playing as a voter with an unspecified disability. In some scenarios, the voter didn't immediately identify their disability. Since this was not intended to test the poll-worker's ability to determine appropriate accommodations, each simulated voter provided information about the accommodations they needed in

18

general language. This sometimes required the poll worker to ask the voter what additional assistance she or he might need. Then the poll worker activated the necessary accessibility features for the voter. Note: due to lack of time, the final poll worker group did not participate in the examiner role-plays.

The Accessibility Examiner took notes about aspects of the system that worked well and problems they encountered during all three phases of the examination. The issues were then categorized based on their impact on a voter's ability to vote independently and privately.

- Positives – things that voters mentioned as meeting or exceeding their expectations
- Annoyances – things voters mentioned as problems, but which did not significantly slow their progress in marking their ballot
- Problem solving – instances where voters hesitated and had to figure out how to complete an action or task, but were able to do so on their own, by exploring the system or relying on past experience with technology
- Needs assistance - problems that could only be solved with help, such as instructions or assistance from a poll worker
- Likely to prevent independent voting for voters with some disabilities-problems that will prevent successful independent and private voting for voters with some disabilities, even with good knowledge about how to use the system and accessibility features

The Accessibility Examiner then compiled the findings including categorizations from the examination into a report submitted to the Secretary.

Security Testing

The Security Testing was done at SLI lab facilities in Wheat Ridge, Colorado. The

19

Security Examiner received the hardware devices from Dominion and the software and firmware were obtained from the Voting System Test Lab (VSTL) which tested the system for EAC certification testing. The Examiner installed the Trusted Build prior to the evaluation using the appropriate media for installation. The Security Testing is comprised of a series of test suites which are utilized for verifying that a voting system will correspond to applicable security requirements within the Pennsylvania Election Code and PA Security Standards. The Security Examiner evaluated each component of the Democracy Suite 5.5 system and the system as a whole for interactions between components. These test suites covered areas of documentation review, design, software security, network capabilities, audit logging, physical security of the voting systems.

The requirements associated to each area of testing were applied to the Democracy Suite 5.5 system in the following manner. The Security Examiner did a review of the EAC testing reports of the system and executed tests for a cross section of Voluntary Voting System Guidelines (VVSG)1.0 requirements to reconfirm compliance. The Security Examiner then designed tests that included in depth verification and validation of reports, audit logs and physical and logical access controls for each of the components of the voting system. The physical security examination included security seals, lock/key combinations, measures for collection of voting in the event of an extended power outage, ballot box and system access points. Tests were done to ensure that election results, media used, reports and audit logs were protected from attempts to decrypt, manipulate and corrupt election data. The Security Examiner also created a vulnerability assessment and performed penetration testing of the Democracy Suite 5.5 system.

Dominion Democracy Suite 5.5A examination

Functional Examination

The follow-up examination was conducted on December 5 and 6, 2018, at SLI Global Solutions facility, 4720 Independence Street, Wheat Ridge, Colorado, and was observed by Department staff remotely in a conference room in BCEL, 210 North Office Building, 401 North Street, Harrisburg, Pennsylvania via web conference. Dominion supplied all the

20

hardware equipment required for the examination. All software and firmware necessary to perform the examination was received directly from the VSTL that tested the voting system for EAC certification. The Functional Examiner installed and/or verified the Trusted Build for each system component. A primary and general election were then run using EMS, ICX-Classic and Prime, ICP and ICC. Results were then tabulated and validated against expected results. The Functional Examiner performed the Source Code and Documentation Review before the witnessed examination.

C.   Examination Results

Democracy Suite 5.5 Functional Examination

On November 17, 2018, the Functional Examiner issued his draft report for the testing of Democracy Suite 5.5 with a recommendation that the system was not in compliance with Section 1107-A(10) and (15), 25 P.S. §§ 3031.7(10) & (15), of the Pennsylvania Election Code. The report noted the following concerns:

1) The ICX BMD did not allow the user to cast a "no vote" in a contest after voting straight party without exiting the straight party option. The system behavior was not intuitive enough for the user to understand and did not adequately communicate to the voter what they needed to do to accomplish their vote intent.

2) The ICX BMD indicated to the voter that they were casting their ballot even though the ballot was only being printed for scanning and tabulation on ICP or ICC.

The Functional Examiner's report indicated successful completion of tests executed to ascertain compliance to all other requirements mandated by the Pennsylvania Election Code. The Examiner report for Democracy Suite 5.5 (Test Report – PDV-003-FTR-01) included details of the test cases, execution and successful completion.   The following section is a summary of the results of the examination as set forth in fuller detail in the Examiner's Report.

1.   Source Code Review

Source Code Review for Democracy Suite 5.5 was performed, with a focus on determining whether any vulnerabilities could be found. The Functional Examiner reported that the code review was completed with no malicious software, cryptographic software, process control or password management vulnerabilities being found. The Examiner concluded that no deficiencies were found during source code review.

2.   Documentation Review

The Documentation Review testing performed by the Functional Examiner demonstrated that the Democracy Suite 5.5 meets the relevant requirements of the Pennsylvania Election Code. The Examiner reviewed the "Test Report for EAC 2005 VVSG Certification Testing of Dominion Democracy Suite 5.5 Voting System"

The review of the EAC test reports by the Functional Examiner and the EAC certifications submitted by Dominion satisfy the requirements of Section 1105-A(a) of the Election Code, 25 P.S.§ 3031.5(a): requiring that an electronic voting system has been examined and approved by a federally recognized independent testing authority (ITA), or VSTL as such authorities are now called, as meeting the applicable performance and test standards established by the federal government.

Functional Examiner concluded that the design requirements of Sections 1107-A(11) and (14) of the Pennsylvania Election Code, 25 P.S. § 3031.7(11) & (14), are met by the combination of EAC hardware Non-Operating Environmental Tests, which included bench handling, vibration, low temperature, high temperature, humidity and product safety tests. The system accuracy testing during EAC certification testing provided confirmation of system accuracy as required by Section 1107-A(11) of the Pennsylvania Election Code, 25 P.S. § 3031.7(11).

The Functional Examiner reviewed the system summative usability test report submitted to EAC to ascertain compliance to the usability requirement of Section 1107-A(15) of the Pennsylvania Election Code, 25 P.S. § 3031.7(15). The review determined that

the system documentation provided met EAC criteria for usability[2].

Accuracy testing performed during EAC certification testing provided confirmation of system accuracy to ascertain compliance to Section 1107-A(13) of the Pennsylvania Election Code, 25 P.S. § 3031.7(13). Additional testing to ensure system accuracy in tabulating PA specific voting scenarios was done during the Primary and General Election runs.

3.   System Level Testing

As set forth in the examination approach, System Level Testing was divided into two separate tests, a closed primary election and a general election. The ballots defined had contests with voting variations supported in Pennsylvania.

A closed primary election consisting of two political parties (Republican, Democratic), three precincts Precinct 1, Precinct 2 - split into Precinct 2a and 2b, Precinct 3, was run utilizing EMS, ICX (Classic and Prime), ICP and ICC (two scanners). For the Republican ballot, there were 21 contests: 19 partisan contests and 2 referendums, 10 "Vote for One", 1 "Vote for no more than Two", 3 "Vote for no more than Three", 4 "Vote for no more than Four" and 1 "Vote for no more than Fifteen". For the Democratic ballot, there were 21 contests: 19 partisan contests and 2 referendums, 11 "Vote for One", 1 "Vote for no more than Two", 1 "Vote for no more than Three", 5 "Vote for no more than Four" and 1 "Vote for no more than Fifteen". Referendum contests were added to test the generation of non-partisan ballots. The Functional Examiner validated compliance of the system to Sections 1101-A and 1107-A(2), (5)-(11) and (13), 25 P.S. §§ 3031.1, 3031.7(2), (5)-(11) & (13). All test cases passed without anomalies.

A general election consisting of four political parties (Republican, Democratic, Green and Libertarian), three precincts (Precinct 1, a split precinct 2, consisting of splits 2a and 2b, Precinct 3)), and 21 contests (19 partisan contests and 2 retentions, 11 "Vote for

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[2] The Functional Examiner, however, further identified during Usability Analysis that the system did not comply with Section 1107-A(15) of the Pennsylvania Election Code, 25 P.S. § 3031.7(15).

One", 1 "Vote for no more than Two", 5 "Vote for no more than Three", 1 "Vote for no more than Four" and 1 "Vote for no more than Fifteen") was run utilizing EMS, ICX (Classic and Prime), ICP and ICC (two scanners). The Functional Examiner examined the compliance of the system to Sections 1101-A and 1107-A(2)-(8), (10)-(11) and (13), 25 P.S. §§ 3031.1, 3031.7(2)-(8), (10)-(11) & (13). All test cases except those validating 25 P.S. § 3031.7(10) passed without anomalies.

Functional Examiner included test cases to validate Sections 1107-A(16) and (17), 25 P.S. § 3031.7(16) & (17), that mandate voting systems to generate zero proof reports and correctly handle over-votes during the election runs. The remainder of the requirements of 25 P.S. § 3031.7(16) and (17) were validated by the Functional Examiner during the Security/Penetration Analysis.

Election definitions for both primary and general elections were created within EMS-EED, and transport media was created to populate ICP, ICX and ICC. Polls were opened and ballots were marked manually, as well as electronically via the ballot marking devices ICX (Prime and Classic). Ballots were tabulated utilizing the ICP and ICC (Canon DR-G1130 and Canon DR-M160-II) scanners.

The Functional Examiner used English and Spanish ballots for the test. Reports were generated after closing polls and results were validated against expected results. Each specific hardware and software component was tested for compliance with the required sections of the Election Code.

The Democracy Suite 5.5 is a paper based system and paper ballots provide a permanent physical record of each vote cast adhering to Section 1101-A(1) of the Election Code, 25 P.S. § 3031.1. Hand-marked paper ballots and ballots marked electronically using ICX are tabulated when voters insert the ballots into the ICP polling place scanner or when the ballots are tabulated at the central location using ICC.

The primary and general election definitions were created using EMS-EED and loaded to polling place devices and central scanners, which provided assurance that the

24

system can perform ballot creation activities. The Functional Examiner successfully added contests including straight party, parties, choices, precincts, districts, ballot styles, referendum questions and retention contests with appropriate candidates and choices. Media was created to load the election to ICP, ICX (Classic and Prime) and ICC. The ICP and ICX (Classic and Prime) components of the Democracy Suite 5.5 successfully permitted votes for "1 of 1," "N of M," and "Question" contests for a standard and ADA voting session. The test cases also included straight party voting to confirm that all appropriate candidates were selected. The Functional Examiner thus concluded that the system is in compliance with Section 1107-A(2), 25 P.S. § 3031.7(2).

Each of the applicable components of Democracy Suite 5.5 allowed the test voter to cast votes for candidates on the ballot and also a write-in vote, demonstrating compliance with Section 1107-A(5), 25 P.S. § 3031.7(5).

Democracy Suite 5.5 meets the requirements for Section 1107-A(6), 25 P.S. § 3031.7(6), because the test voters cast votes on different ballot styles for candidates and questions and the ICX (Classic and Prime) displayed only contests for which the voter was entitled to vote.

The system's compliance to Section 1107-A(7), 25 P.S. § 3031.7(7), was demonstrated since ICP has the capability to indicate overvotes for any office and the voter has the ability to either spoil the ballot or cast the ballot with overvotes if the voter decides to do so. Ballot marking device ICX (Classic and Prime) did not allow overvotes. The Functional Examiner also noted that the system allowed undervotes, but warned the user about the undervote if configured to do so.

The successful validation of the election results showed that ICC as well as precinct tabulator ICP include the capability to reject all choices recorded on the ballot for an office or question if the number of choices exceeds the number for which the voter is entitled to vote, adhering to Section 1107-A(8), 25 P.S. § 3031.7(8).

The Democracy Suite 5.5 complies with Section 1107-A(9), 25 P.S. § 3031.7(9),

because test voters in the closed primary election were only able to vote for referendum questions and candidates seeking the nomination of their party.

The Functional Examiner validated adherence to Section 1107-A(10), 25 P.S. § 3031.7(10), for both ADA and standard voting sessions. Ballot marking device ICX (Classic and Prime) allowed the voters to review their ballots before printing for tabulation on ICP or ICC. The Functional Examiner attempted to change votes on ICX (Classic and Prime) for candidates within the contest, as well as after leaving the contest and then returning to other contests and while reviewing the summary screen. The tests demonstrated that ICX allowed changing the selections until the voter decides to print the ballot. The Functional Examiner noted that the system did not intuitively allow the voter to deselect all candidates in a contest after voting straight party. The BMD, ICX (Prime and Classic), also showed a message to the voter that they were casting the ballot even though the ballots were being printed to be scanned and tabulated on the ICP or ICC. The ICP, precinct scanner of Democracy Suite 5.5 provides the voter with a caution message when the ballot contains errors, such as overvotes or undervotes. The voter is also presented an error report on the screen when the tabulator detects potential errors. The voter can either decide to affirm their intent by casting the ballot, or spoil the ballot and fill out another ballot.

Accuracy requirements of 1107-A(11), 25 P.S. § 3031.7(11), previously ascertained by reviewing EAC test reports were further validated by the successful tabulation and validation of the primary and general elections run by the Functional Examiner.

The Functional Examiner validated via test cases during the primary and general election that the tabulating devices ICP and ICC generated zero proof reports only before ballots were cast, the system rejected all votes for the contest in an overvote situation, and produced a results report when appropriately configured, as required under Sections 1107-A(16) and (17), 25 P.S. § 3031.7(16) & (17). The Functional Examiner confirmed that the zero-proof report cannot be generated on demand after a ballot is cast.

Ballots were marked by hand including write-in votes during the general election to

examine the system's ability to properly enact the PA method of straight party voting. The ICP, ICC and ICX (Classic and Prime) demonstrated compliance to Sections 1107-A(3) and (4), 25 P.S. § 3031.7(3) & (4). The ballot marking devices allowed marking ballots following the PA method and the scanners/tabulators appropriately tabulated ballots with PA method test scenarios.

The voting variations used for the examination included write-in votes, to ensure that all components of the system will identify the appropriate write-ins and allow the election official to tabulate all votes including write-in votes.

4.   Security/Penetration Analysis

The Functional Examiner adopted a strategy to review each pertinent requirement for this test individually and then created test cases to address it in either a documentation review, a functional test, or both.

Precinct tabulation devices and ballot marking devices were configured for delivery to a polling place from warehouse including all seals and locks recommended by the manufacturer. The central scanners were configured for operation in a county office. The devices were inspected for the ability to be tampered with. The Functional Examiner examined the polling place equipment to confirm the following:

- Adequate seals and locks are present to prevent tampering, and the system provides noticeable evidence if any tamper attempt (successful or failed) occurs (ICP, ICX - Classic and Prime);

- There is no access to the ballots/ballot cards, either via printer, the ICP or ballot card stock, to tamper or substitute any ballots (processed, unprocessed, challenged or provisional) (ICP, ICX – Classis and Prime);

- Devices are not accessible to unauthorized personnel to programmatically tamper with the device that would affect ballot presentation, print, or any other feature/activity (ICX – Classic and Prime);

- Devices not accessible to unauthorized personnel to programmatically tamper with the device that would affect ballot processing, delivery to ballot box, or any other feature/activity (ICX – Classic and Prime and ICP); and

- The Ballot box is tamper proof and/or tamper evident.

The Functional Examiner physically examined the central count equipment ICC for ballot security procedures, and verification of the system adequately preventing the tampering and substitution of ballots.

The Functional Examiner also examined the components of the Democracy Suite 5.5 system for password management of administrative functions and ensured that the system counter could not be reset by unauthorized persons. In addition, the Functional Examiner also reviewed Dominion System Documentation for ballot security procedures at the polling place and central location to ensure that the manufacturer recommended the required steps for configuring the Democracy Suite 5.5 securely for Election. Based on the tests the Functional Examiner concluded that that the system complies to 1107-A(12), 25 P.S. § 3031.7(12).

The Functional Examiner included test cases during the Security/Penetration analysis phase of the testing to evaluate the security requirements mandated by Setion1107-A(16) and (17), 25 P.S. § 3031.7(16) & (17). The Functional Examiner validated that the polling place tabulation device, the ICP, had a visible public counter and the system prevented authorized and unauthorized users access to vote data while polls are open. Tests were completed to verify that USB ports do not allow any data or information to be transferred to the ICP and no maintenance, poll worker or administrator accessible screens allow tampering with the tabulating element. The system did not allow polls to be opened without running a zero-proof report and the content of zero-proof report showed that all candidate positions, each question and the public counter were all set to zero. The functionality of the system to generate the close of polls report was verified and the report contents were analyzed to ensure that it contained the total number of ballots tabulated and total number of votes for each candidate and question on the ballot. Based on the above tests and the test cases executed while running the elections, the Functional Examiner concluded that

28

Democracy Suite 5.5 complies with all requirements mandated by 25 P.S. §§ 3031.7(16) and (17).

5.   Privacy Analysis

The Functional Examiner reviewed and inspected the privacy aspects of the Democracy Suite 5.5 system to determine compliance with Section 1107-A(1) of the Election Code, 25 P.S. § 3031.7(1). The Functional Examiner determined that the components of the system used at the polling place comply with 25 P.S. § 3031.7(1) by review of system documentation and physical inspection. Central scanners were physically examined by the Examiner for adequate visual secrecy. The Functional Examiner also verified that no voter data, including stored ballot images are tied back to any specific voter, in a manner that would compromise voter secrecy.

6.   Usability Analysis

The Functional Examiner determined that Democracy Suite 5.5 demonstrated compliance with the usability requirements of Section 1107-A(14) of the Election Code, 25 P.S. § 3031.7(14) , by reviewing appropriate EAC certification reports and vendor documentation. The Examiner determined that the ICX (Classic and Prime) BMD did not comply with the requirements of Section 1107-A(15) of the Election Code, 25 P.S. § 3031.7(15), since the system did not allow the user to cast a "no vote" in a contest after voting straight party without exiting the straight party option. The system behavior was not intuitive enough for the user to understand and did not adequately communicate to the voter what they needed to do to accomplish their vote intent. Additionally, the ICX-BMD informed the voter that they are "casting" their vote even though the ballot was only being printed for scanning and tabulation on ICP or ICC.

Democracy Suite 5.5 Accessibility Examination

The tests included examiner review, and sessions with voters and poll workers. A summary of the test details and findings is discussed in this section.

29

Examiner Review

The Accessibility Examiner conducted a review of the voting system under examination prior to sessions with voters and poll workers. The Accessibility Examination team included both accessibility and usability expertise to ensure background and knowledge of the issues for accessible voting. The Accessibility Examiner had experience working with people with a wide variety of disabilities and their impact on daily life, knowledge of the range and use of assistive technologies that voters with disabilities might rely on for access, experience conducting usability evaluations with voters and strong knowledge of best practices and design principles for digital technology and voting systems. The expert review gave the examiners a chance to make sure they understand how the system and accessibility features works and to note anything they want to watch for during other testing.

Voter Sessions

The following voter population was represented in the test sessions:

- 4 blind from birth
- 1 late onset blindness
- 1 dexterity/limited use of hands

Age Ranges: 35 thru 70. All but one (a 70-year old) were in the 35-60-year-old age range.

Counties: Allegheny, Dauphin, Lebanon, Philadelphia, or York

Voters had a range of voting experiences. The Accessibility Examiner noted that the test population included a limited range of disabilities and the top problems with the ICX and ICP machines largely focused on issues a low or no vision voter would experience.

30

Poll worker Sessions

Poll workers were invited to come in teams. We had a total of fourteen participants across five sessions, which represented poll workers in Perry and Dauphin counties. The poll worker groups:

- Had between five and twenty-six years of experience.
- Had at least one election judge
- Were experienced with the Danaher ELECTronic 1242 and the ES&S iVotronic systems
- Had mostly limited experience serving voters with disabilities.

Unique facts about the poll worker groups:

- Three poll workers had blind family members
- One poll worker was blind
- One poll worker was a retired user interface designer

The Accessibility Examiner noted that poll workers with a wider range of voting system experience and different sized communities would have provided a better sample size for the test.

The Accessibility Examiner compiled the findings from the examiner review, voter sessions and poll worker sessions into positives, annoyances, problem solving, needs assistance and likely to prevent independent voting for voters with some disabilities. The Accessibility Examiner included recommendations for improving the accessible voting experience with each of the top five accessibility issues identified. The report also included recommendations on how election officials can support voters and poll workers when the new system is fielded. This section presents a summary of the report. Attachment B of this document lists these issues and recommendations in fuller detail and also describes all the observations from the Accessibility Examination.

The Accessibility Examiner noted in the summary section of the report that the

Dominion systems are an advance in independence and privacy for Pennsylvania voters with disabilities, and identified several positive aspects of the system including the following:

- Voters could vote privately and independently.

- Access features were easily learned by voters and poll workers, and poll workers reported the features would help their voters.

- Sufficient default text size for all sighted voters and the ability to increase to a larger font, if desired.

- Visual interface is clean and generally intuitive.

- Printed ballots could easily be read by app-based screen readers

The top five accessibility issues identified by Accessibility Examiner and voters are summarized in the following section. The Department further evaluated each of the findings and recommendations from the Accessibility Examiner and included the fielding recommendations as conditions for certification of the system[3]. The Department also discussed the findings from the Accessibility testing, specifically the ones that were marked as "Likely to prevent independent voting for voters with some disabilities" to ensure that appropriate fielding recommendations would alleviate the concerns for most voters.

Top 5 Accessibility Issues:

Privacy and independence restrictions -

- Poll workers must create a special voter card and initialize the assistive devices for voters. This means voters have to disclose disabilities to poll workers or poll workers have to guess voter's abilities.

- The large ICX touchscreen and placement inside the voting booth may make it possible for other voters and people in the polling location to see how the

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[3]Examples of conditions for certification can be found in this report at identification numbers B, R, T, U, V, FF and GG which relate to the top five accessibility issues found during the examination findings.

voter is voting, unless the county mitigates this risk when configuring the polling place.

Assistive technologies quality, instructions, and feedback –

- For the ICX audio, one voice provides voting instructions and the other announces ballot content. These appeared to use different technologies. Initially, there was a dramatic volume difference between the two, but the vendor was able to correct this problem. The rate of speech is different for the two voices, and the content voice is difficult to understand at very slow or high speeds because of how the audio playback managed the speed.

- The tactile keypad has duplicated buttons and a help button that is not helpful.

- The voting instructions are persistent and repetitive, with poor phrasing that makes it difficult for voters to understand. Lastly, the content of the instructions is too wordy, confusing, and ultimately unhelpful. Voters found it easier to ignore the instructions.

Write-in process

- The write-in process was difficult for the blind voters, and each required some facilitator aid to successfully finish.

- For voters using the audio assistance, there are no instructions to help a voter edit and verify their write-in.

Silent/Hidden selection and deselection

- The implementation of the straight party option made candidate selection and deselection confusing for some voters.

- When candidates overrode their straight party vote in a longer contest, candidates could be deselected off screen and out of the voter's view, without any system alert.

- Overvote protections on the system greys out the remaining options once the maximum number of selections are reached. This may cause the voter using the audio ballot to not hear all of the options in a contest.

Paper ballot handling

- The scanner bed is very shallow and cannot support the entire ballot, and if the ballot is not inserted properly, the scanner will return it to the voter. Since the scanner bed is not full size, the ballot may fall on the floor.

- There are no audible cues to assist blind voters, and the scanner screen is not easy to see.

- Contest alerts used on the paper ballots are not used or worded differently on the touchscreen device.

- The Accessibility Examiner noted that paper ballot is printed on cardstock and can be read by personal assistive devices. It was noted that the system uses a COTS printer for printing the ballots and the voters need not handle blank ballots before making the choices. The implementation reduces the verifiability for voters using assistive devices, since the ballot cannot be reinserted to be "read back". Three out of the five blind voters were able to use app-based print readers to read the ballot back to them.

- There are no audible cues on the ICP to assist blind voters, and the scanner screen is not easy to see.

The Accessibility Examiner noted that both test voters and poll workers stressed the need for a strong education program to introduce the new systems, including opportunities for hands on training or practice as a new system is rolled out. The examination team also stressed the need for well thought out deployment of any new voting machines (recommendations listed in Attachment B) and effective poll worker training.

Democracy Suite 5.5 Security Examination

As mentioned in the Examination Approach section of this document, the Security Examiner defined the Security Testing to be comprised of a series of test suites which are utilized for verifying that a voting system will correspond to applicable security requirements within the Pennsylvania Election Code. The examiner analyzed the test results

34

and summarized any identified deficiencies into 4 major categories: documentation, source code, hardware, and functional. The Security Examiner then evaluated the physical and logical security, software hardening and control measures in place and identified items that required remediation before the system is certified for use in Pennsylvania.

The security testing identified the need to modify the hardening procedures for EMS and the ICX BMD printer for a more secure installation. The examiner also provided recommendations on secure implementation and deployment.

Democracy Suite 5.5A Examination Results

Democracy Suite 5.5A Functional Examination

As identified in the test approach section of this document the follow-up examination of Democracy Suite 5.5A included Documentation Review, Source Code Review and System Level Testing and Usability Analysis.

1.   Documentation Review

The Examiner reviewed the draft "Test Report for EAC 2005 VVSG Certification Testing Dominion Voting Solutions Democracy Suite 5.5A voting system". The review confirmed that the Dominion Democracy Suite 5.5A has been evaluated to federal standards by a VSTL. Democracy Suite 5.5A was provided the initial certification decision by EAC on December 20, 2018, which serves as an acknowledgement by EAC that the system has successfully completed conformance testing to VVSG 1.0, and hence complies with Section 1105-A(a) of the Election Code, 25 P.S.§ 3031.5(a), which requires that a voting system must be examined and approved by a federally recognized independent testing authority (ITA), or VSTL as such authorities are now called.

2.   Source Code Review

A Source Code Review for the code modifications for Democracy Suite 5.5A was performed, with a focus on determining whether any vulnerabilities could be found that would warrant additional testing. The Functional Examiner concluded that no vulnerabilities

35

were found during source code review that would warrant additional testing.

3.   System Level Testing

The System Level Testing was divided into two tests, a primary election and general election. The Functional Examiner included test cases to specifically test the PA method anomalies identified during Democracy Suite 5.5 testing as part of the general election.

A closed primary election consisting of two political parties (Republican, Democratic), three precincts (Precinct 1, Precinct 2 - split into Precinct 2a and 2b, Precinct 3 was run utilizing EMS, ICX (Classic and Prime), ICP and ICC (two scanners - Canon DR-G1130 & Canon DR-M160-11). For the Republican ballot, there were 21 contests: 19 partisan contests and 2 referendums, 10 "Vote for One", 1 "Vote for no more than Two", 3 "Vote for no more than Three", 4 "Vote for no more than Four" and 1 "Vote for no more than Fifteen". For the Democratic ballot, there were 21 contests: 19 partisan contests and 2 referendums, 11 "Vote for One", 1 "Vote for no more than Two", 1 "Vote for no more than Three", 5 "Vote for no more than Four" and 1 "Vote for no more than Fifteen". Referendum contests were added to test the generation of non-partisan ballots. The Functional Examiner validated compliance of the system to Sections 1101-A and 1107-A(2), (5)-(11) and (13), 25 P.S. §§ 3031.1, 3031.7(2), (5)-(11) & (13). No issues or anomalies were experienced during these tests, and the objective criteria established in the test protocols were met.

A general election consisting of four political parties (Republican, Democratic, Green and Libertarian), three precincts one of which was a split precinct (Precinct 1, split precinct 2, consisting of splits 2a and 2b, Precinct 3) , and 21 contests (19 partisan contests, and 2 retentions, 11 "Vote for One", 1 "Vote for no more than Two", 5 "Vote for no more than Three", 1 "Vote for no more than Four" and 1 "Vote for no more than Fifteen") was run utilizing EMS, ICP, ICX and ICC. The Functional Examiner examined the compliance

36

of the system to Sections 1101-A and 1107-A(2)-(8), (10)-(11) and (13), 25 P.S. §§ 3031.1, 3031.7(2)-(8), (10)-(11) & (13).

The Functional Examiner created election definitions and executed appropriate test cases on all components of Democracy Suite 5.5A to ensure that the modified system satisfies all requirements of the Election Code. The Functional Examiner used English and Spanish ballots for the test. Reports were generated after closing polls and results were validated against expected results. Each specific hardware and software component was tested for compliance with the required sections of the Election Code.

The Functional Examiner confirmed with appropriate test cases and voting patterns that Democracy Suite 5.5A maintains compliance to Sections 1101-A and 1107-A(2), (4)-(11) and (16)-(17), 25 P.S. §§ 3031.1, 3031.7(2), (4)-(11), (16) & (17), via tests cases in a similar manner as done during the Democracy Suite 5.5 examination. The Functional Examiner validated that the issues identified during the examination of Democracy Suite 5.5 are resolved and demonstrated compliance to Section 1107-A(10), 25 P.S. § 3031.7(10).

4.   Usability Analysis

The Functional Examiner validated that the usability issues on the ICX BMD noted during the Dominion Democracy Suite 5.5A were resolved. The ICX-BMD did not have any references to the word "cast" during the printing process. The ICX-BMD displayed a pop up message requiring user acknowledgement indicating that the voter has to exit out of the straight party option to cast a "no vote" in a contest. The Functional Examiner hence concluded that the system demonstrated compliance to Section 1107-A(15), 25 P.S. § 3031.7(15).

Additional Security/Penetration and Privacy analysis were not conducted during the Democracy Suite 5.5A examination since the test cases validated during these tests were not affected by the isolated modification done to the ICX-BMD to resolve the anomalies noted during the Democracy Suite 5.5 examination.

The Functional Examiner also noted that the paper ballots will allow recounts as required by Sections 1117-A, 25 P.S. § 3031.17. The Functional Examiner identified that the following within Article XI-A of the Pennsylvania Election Code, Sections 1101-A to 1122-A, 25 P.S. §§ 3031.1 – 3031.22, are not applicable to the current examination, as each deal with non-functional testing aspects of acquisition, use and maintenance aspects of a voting system:

- 25 P.S. § 3031.2;
- 25 P.S. § 3031.3;
- 25 P.S. § 3031.4;
- 25 P.S. § 3031.6;
- 25 P.S. § 3031.8;
- 25 P.S. § 3031.9;
- 25 P.S. § 3031.10;
- 25 P.S. § 3031.11;
- 25 P.S. § 3031.12;
- 25 P.S. § 3031.13;
- 25 P.S. § 3031.14;
- 25 P.S. § 3031.15;
- 25 P.S. § 3031.16;
- 25 P.S. § 3031.18;
- 25 P.S. § 3031.19;
- 25 P.S. § 3031.20;
- 25 P.S. § 3031.21; and
- 25 P.S. § 3031.22.

After all the testing activities, the examiners and Department concluded that the Democracy Suite 5.5A demonstrates compliance with all requirements as delineated in Article XI-A of the Pennsylvania Election Code, Sections 1101-A to 1122-A, 25 P.S. §§ 3031.1 – 3031.22. The conclusion was drawn based on the examination of Democracy Suite 5.5A in conjunction with the Democracy Suite 5.5 examination.

Democracy Suite 5.5A Security Examination

The Security Examiner evaluated the documentation changes made to the system hardening procedures and confirmed that if the system is implemented following the hardening procedures, it provides a secure implementation.

D.   Observations

During the examination, and in the review of documentation, the Examiner and/or Department staff noted the following observations:

1.   The system presented for examination had undervote warnings turned on for straight party contest on ICX (Classic and Prime). This may make the voter believe that there is a need to make a selection in that contest.

2.   Observations/Findings from the Accessibility Examination are listed on pages 32 thru 34 and as Attachment B of this document.

3.   Dominion Democracy Suite 5.5A does not support cumulative voting.

4.   The configuration of the system complying with the Pennsylvania Election Code requirements including the PA method of straight party voting will require the use of appropriate selections of configurable parameters.

5.   The ADA compliant ballot marking device ICX (Classic and Prime) presented as part of the Democracy Suite 5.5A system, could be effectively used by all voters. This allows jurisdictions to expand the use of these devices for a larger universe of voters and not restrict their use to voters using assistive devices.

6.   The system allows configuration of button labels, warning/alert messages, voter instructions etc. There are some configuration elements that can be configured via the EMS Graphical User Interface (GUI) while there are some elements like button labels that cannot be configured via Graphical User Interface and will need to be done by editing a configuration (JSON) file on the EMS server.

7.   The use of voter access cards for activation will create a lot of components to

39

manage and track on Election Day. Creating a large number of voter activation cards prior to Election Day would make it difficult to keep track of the card inventory. If jurisdictions choose to create cards on demand that would necessitate the need for an additional system at the polling place.

8.   The ICX (Classic and Prime) BMDs use a COTS printer for printing marked ballots. The printer settings need to be appropriately adjusted for the printed ballots to be read by ICP or ICC.

IV.   Conditions for Certification

Given the results of the examination that occurred in October and December 2018 and the findings of the Examiners as set forth in their reports, the Secretary of the Commonwealth certifies the Democracy Suite 5.5A subject to the following conditions:

A.   This certification for Democracy Suite 5.5A is based on the EAC initial certification decision dated December 20, 2018, and will be appended with the final EAC certification documentation after the final EAC certification is issued.[4] Any jurisdictions purchasing and implementing the system before the final EAC certification must perform a trusted build validation after the final EAC certification to ensure that the certified system components are installed. This validation must happen even if the jurisdiction has done a trusted build validation during the system acceptance.

B.   Pennsylvania counties using the Democracy Suite 5.5A must comply with the Directive Concerning the Use, Implementation and Operations of Electronic Voting Systems by the County Boards of Elections issued by the Secretary of the Commonwealth on June 9, 2011, and any future revisions or directives. In particular, Pennsylvania counties must adhere to item four (4) of the directive when setting up and positioning the ICX in the

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[4] This certification is being issued due to the unique circumstances of the federal government shutdown after the successful initial certification decision was issued by the EAC and notice was given that no further testing is necessary. Consequently, only ministerial documentation remains, which will be appended once issued.

polling place to assure compliance with the constitutional and statutory requirements that secrecy in voting be preserved (see Pa. Const Art. VII § 4; and Section 1107-A(1) of the Election Code, 25 P.S. § 3031.7(1)). The ICX (Classic and Prime) screens have large size and high-resolution display and are very clear and can be viewed at wide angles without distortion. Jurisdictions must make a note of this while setting up polling places and purchase privacy booths.

C.   No components of the Democracy Suite 5.5A shall be connected to any modem or network interface, including the Internet, at any time, except when a standalone local area wired network configuration in which all connected devices are certified voting system components. Transmission of unofficial results can be accomplished by writing results to media, and moving the media to a different computer that may be connected to a network. Any wireless access points in the district components of Democracy Suite 5.5A, including wireless LAN cards, network adapters, etc. must be uninstalled or disabled prior to delivery or upon delivery of the voting equipment to a county board of elections.

D.   Because Democracy Suite 5.5A is a paper-based system, counties using the Democracy Suite 5.5A must comply at a minimum with Section 1117-A of the Election Code, 25 P.S. § 3031.17, that requires a "statistical recount of a random sample of ballots after each election using manual, mechanical or electronic devices of a type different than those used for the specific election." This audit must be conducted via a manual count of the voter marked paper ballots exclusively. Counties must include in the sample ballots marked by ADA compliant components. Counties are advised to consult the Directive Concerning the Use, Implementation and Operations of Electronic Voting Systems by the County Boards of Elections issued by the Secretary of the Commonwealth on June 9, 2011 and any future revisions or directives that may apply to audits of electronic voting systems.

E.   All jurisdictions implementing the Democracy Suite 5.5A need to carry out a full Logic and Accuracy test on each device without fail and maintain evidence of Logic and Accuracy (L&A) testing in accordance with the statutory requirements for pre-election and post-election testing. Jurisdictions must include audio ballots and accessible devices during

41

L&A testing. The Department does not recommend automated L&A testing, and discourages the use of preprinted ballots provided by vendors. All components being used on election day, including any Electronic Poll Books being used, must be part of the L&A testing. Counties must ensure that the L&A test cases include all applicable scenarios of the PA straight party method identified in Attachment C to the Directive for electronic voting systems published by BCEL on September 11,2017.

     F.   Democracy Suite 5.5A is a paper-based system and hence, implementation of the system for precinct or central count scanning is scalable. Jurisdictions should calculate the number of voting booths necessary to accommodate the number of registered voters in a precinct to avoid long lines. Jurisdictions must include the ICX as an ADA compliant device in configuring a precinct polling place. Jurisdictions must also take into consideration the ICP scanning speed, ballot box and Transport Media capacities on polling place components when deciding on the number of voting booths.

     G.   All jurisdictions implementing the Democracy Suite 5.5A must implement administrative safeguards and proper chain of custody to facilitate the safety and security of electronic systems pursuant to the Guidance on electronic Voting System Preparation and Security, September 2016.

     H.   Jurisdictions implementing the Democracy Suite 5.5A with the Central Count Tabulator as the primary system, where votes are counted only at the central counting location using central scanners, must comply with Section 301(a) of Help America Vote Act of 2002. The mandate requires counties using central count paper-based systems to develop voting system specific voter education programs that inform voters of the effect of over voting, and instruct voters on how to correct a ballot before it is cast, including instructions on obtaining a replacement ballot. Additionally, the mandate requires that the central count voting system must be designed to preserve voter confidentiality.

     I.   All jurisdictions implementing the Democracy Suite 5.5A must ensure that no default passwords are used on any devices and that all passwords are complex and secured. Counties must implement an audit process to review and ensure that no default passwords are

42

used upon equipment install/reinstall and routinely change passwords to avoid any password compromise. The passwords and permissions management must at a minimum comply to the password requirements outlined in NIST 800-63. This publication can be accessed at https://pages.nist.gov/800-63-3/sp800-63-3.html.

J.   All jurisdictions implementing Democracy Suite 5.5A must configure the polling place components of the voting system to notify voter on overvotes.

K.   All jurisdictions implementing Democracy Suite 5.5A must work with Dominion to ensure that only the certified system configuration is installed on purchase or anytime a system component is replaced or upgraded. Jurisdictions must as part of their user acceptance test verify the implementation to ensure that the components, software and firmware belong to the certified system. Jurisdictions must also perform a trusted build validation as part of the election preparation activities and post-election canvass activities utilizing the vendor supplied methods of validation and verification of voting system integrity. A sample format that can be used for the attestation is added as Attachment C to this document.

L.   Dominion must work with the jurisdictions implementing Democracy Suite 5.5A to ensure that the system has been hardened for a secure implementation. Jurisdictions must implement processes to ensure that all components of the voting system have been hardened per the instructions in the TDP.

M.   Jurisdictions can make use of the adjudication functionality to adjudicate write-ins and evaluate questionable ballots, contests or selections to determine voter intent. Any decisions made during review of the ballot must be agreed upon by a team of at least two reviewers authorized by the election official. The election official can also consult the paper ballot to assist with determinations made during adjudication. In the event of a recount, the voter verified paper ballots must be used for the count.

N.   Jurisdictions implementing Democracy Suite 5.5A must work with Dominion to ensure that the implemented configuration is capable of operating for a period of at least two hours on backup power as required by the VVSG. If the system components don't

include internal battery packs for reliable power, the Uninterruptible Power Supply (UPS) specified in the EAC certified configuration must be purchased and used at the polling places.

O.   Jurisdictions using the services of Dominion or a third-party vendor for election preparation activities must work with Dominion or the vendor to ensure that systems used for ballot definition activities are considered part of the voting system and use certified voting system components. The systems used for ballot definition must be configured securely following conditions outlined in this report and following any Directives and Guidance issued by the Secretary. Any data transfer between the vendor and county must be done using encrypted physical media or secure file transfer process. The file transfer and download must be tracked and audited to make sure that data has not been accessed by unauthorized personnel.

P.   Jurisdictions must implement processes and procedures involving management, monitoring and verification of seals, locks/keys, before, during and after the election.

Q.   Jurisdictions must not use individual voter access cards for activating the ICX Ballot Marking device. This is to avoid lost, stolen or misplaced cards with the activator chip, which would be a potential vulnerability. Jurisdictions using poll worker cards for ICX activation must ensure that poll workers are trained to maintain strict chain of custody of the activation card.

R.   Dominion must ensure that any implementations in Pennsylvania counties must appropriately indicate that the ICX BMD is printing the ballot and the final messaging on the ICX must instruct the voter on how to complete the voting process. Any references to "casting the ballot" must not be present. The changes must be done during implementation by Dominion support personnel and verified by county election officials.

S.   Jurisdictions must have appropriate instructions on the ICX BMD to ensure that the voter reviews the entire ballot before printing the ballot. This is to avoid voters

44

missing selections in contests, especially after voting straight party.

T.   Jurisdictions must work with Dominion to ensure that the entire audio ballot including audio rates and volumes on the audio ballot are tested before deploying to polling places. Jurisdictions must also ensure that poll worker training includes potential situations and questions from voters using the audio ballot. This is specifically important for Dominion Democracy Suite 5.5A. Jurisdictions must note that the general instructions and ballot instructions are configured separately and could have different volume setting and audio rates. This was noted during the Accessibility Examination and made the audio ballot almost unusable before adjusting the volume settings. Specific attention must be given to ensure that the audio ballots are tested by multiple personnel to evaluate the voice quality and the instruction accuracy.

U.   Jurisdictions must work with Dominion during the ballot definition to ensure that voters using assistive devices have clear instructions for the write-in process. The on-screen instructions must be adjusted to have the audio ballot explain the process. The audio instructions must include instructions on how to navigate and find the write-in keyboard.

V.   Jurisdictions must work with Dominion to thoroughly test and review audio ballot instructions to ensure that the voters using an audio ballot can cast the ballot without requesting assistance. Jurisdictions must consider the following while reviewing the ballot:

- The audio ballot must fully inform the voter what has happened on the system and how to select/deselect their choices;

- The feedback messages must explain to voters what is happening, including the number and names of candidates being deselected; and

- The audio ballot must provide feedback on the reason for the changes in any selections and the interaction with straight-party choices.

W.   Jurisdictions must make voters aware that voting straight party is optional via clear instructions on paper, on screen and audio ballots. This is to ensure that the voter

45

doesn't assume that he/she must make a selection for the straight party contest. The ballot instructions must be approved by the Department and follow any directives and/or guidance issued by the Department. Jurisdictions must also ensure during the election definition process that the straight party contest is excluded from undervote warnings. This is to ensure that the voter doesn't assume that he/she must make a selection for the straight party contest.

X.   Dominion must ensure that the COTS printer used for ICX BMD (HP LaserJet Pro Printer M402dn /HP LaserJet Pro Printer M402dne) must be configured to ensure that the printer settings cannot be changed by the voter at the polling place. The configuration must ensure that the printer settings can only be modified by authorized personnel.

Y.   The electronic voting system must be physically secured while in transit, storage, or while in use at their respective locations. Unmonitored physical access to devices can lead to compromise, tampering, and/or planned attacks.

Z.   Jurisdictions must implement processes and procedures involving management, monitoring and verification of seals, locks/keys, before, during and after the election.

AA.   Jurisdictions must seal any unused ports on the voting system components using tamper evident seals even if the port is inside a locked compartment. Jurisdictions must work with Dominion and use physical port blocking plugs to close unused ports whenever possible before placing the tamper evident seal. The Department also recommends using port blocking plugs for exposed ports for components of the voting system housed in county office that can be removed by authorized personnel when the port is needed.

BB.   Jurisdictions using standalone installation of the EMS server on portable devices must protect the laptops to prevent lost or stolen device.

CC.   Jurisdictions must implement processes to gather and safekeep system logs for each component of the voting system after each election. Consistent auditing of system

46

logs and reports is vital to maintain system transparency and to ensure that any compromise or malfunction is observed and reported in a timely manner.

DD.   Jurisdictions implementing Democracy Suite 5.5A must ensure that the USB devices and any other removable or transportable media used for election activities is maintained with strict chain of custody. There must be a process to manage the removable/transportable media inventory to avoid misplaced and lost media. The devices must either be replaced or reformatted before use in each election. Appropriate steps must be taken to ensure that the format is a full reformat of the USB devices.

EE.   Jurisdictions implementing Democracy Suite 5.5A must work with Dominion to ensure appropriate levels of training for election officials is planned on implementation. Counties must ensure that the trainings adhere to the "Minimum Training Requirements" specified in Attachment D of this document.

FF.   Jurisdictions implementing Democracy Suite 5.5A must include voter and poll worker training as part of the implementation plan. The training must include hands on practice for both voters and poll workers. Specific consideration must be given to voters using assistive devices and also poll worker education to assist voters with disabilities. Refer to Attachment B, listing detailed recommendations for deployment noted by the Accessibility Examiner.

GG.   Jurisdictions implementing Democracy Suite 5.5A must consider the following during voting booth set up for serving voters requiring assistive devices

- o   Voters with disabilities may have assistive technology or personal notes that they need to place within reach. They may also need room to place the printed ballot on a flat surface to use personal technology such as magnifiers or text readers to verify it.

- o   The path between ICX and the ICP should be as easy as possible, ideally a straight line with no obstructions. The path should include ample room to turn a wheelchair if the machine is positioned with the screen facing the wall. The

47

ADA standards suggest a minimum of 60x60 inches for this.

o The cords for tactile keypads, headphones and BMD printer need to be placed so that they don't interfere with the printed ballot and the voter's ability to find and take the ballot.

Refer to Attachment B, listing detailed recommendations for deployment noted by the Accessibility Examiner.

HH.   Jurisdictions implementing Democracy Suite 5.5A must ensure that the iButton used for activating administrative access on ICP is managed with strict chain of custody. The iButton pass codes must be modified at a minimum for every election. If an iButton pass code requires change after the initial assignment, appropriate EMS options must be selected to ensure that only the latest assigned iButton pass code is active.

II.   Dominion must submit the following system education materials to the Department of State and must consent to the publication and use of the video on any websites hosted by any Pennsylvania counties and the Pennsylvania Secretary of the Commonwealth or publicly available social media platform. The videos must have audio instructions and must be closed captioned.

o A video (in an electronic format) for voters that demonstrates how to cast a vote using the Voting System.

o A video (in an electronic format) for precinct election officials that demonstrates how to setup, operate, and shutdown the Voting System components on an Election Day. The video must demonstrate how to set up and operate the voting system accessible devices for use by voters.

o A "quick reference guide" for precinct election officials to consult on Election Day. The guide must be specific to the purchasing county's setup and use of the Voting System including accessible options.

o A "quick reference guide" with images that demonstrates to voters how to cast

48

a vote. Must be provided in additional languages for any jurisdictions required to meet thresholds in the Voting Rights Act.

JJ.   Dominion must adhere to the following reporting requirements and submit the following to the Secretary:

- o Equipment Reporting. Reported field issues or anomalies that occur in Pennsylvania or elsewhere with any piece of equipment deployed in the Commonwealth of Pennsylvania within 3 days of the occurrence;

- o Advisory Notices. System advisory notices issued for any piece of equipment deployed in the Commonwealth of Pennsylvania regardless of whether the incident behind the notice occurred in Pennsylvania;

- o Ownership, Financing, Employees, Hosting Location. Any changes of information on the Supplier's employees and affiliates, locations, company size and ability to provide technical support simultaneously to several counties in the Commonwealth of Pennsylvania and other jurisdictions that use its Voting System. Additionally, Dominion must provide information on foreign ownership/financing, data hosting, and production for any equipment or ancillary products, including any potential conflict of interest that may have developed for employees and affiliates;

- o Security Measures and any updated security testing or risk/vulnerability assessments conducted by the Supplier or a third-party; and

- o SOC 2 Reporting – Dominion shall provide the Secretary with its annual American Institute of Certified Public Accountants (AICPA) Attestation Standard (AT) Sec. 101 Service Organization Control ("SOC") 2, Type 2 certification (AT Sec. 101 SOC 2, Type 2), or an equivalent certification approved by the Commonwealth. Equivalent certifications include, but are not limited to: International Organization of Standards (ISO) 2700x certification; certification under the Federal Information Security Management Act

49

(FISMA); and AT Sec. 101 SOC 3 (SysTrust/WebTrust) certification.

KK.   Dominion must adhere to the "Source Code and Escrow Items Obligations" specified in Attachment E of this document. In addition, Dominion must provide a copy of the source code on a password protected CD to the Secretary.

LL.   Dominion must work with jurisdictions to ensure that the system is configured to comply with all applicable requirements of PA Election Code delineated in Section Article XI-A of the Pennsylvania Election Code, sections 1101-A to 1122-A, 25 P.S. §§ 3031.1 – 3031.22.

MM.   Jurisdictions implementing the Democracy Suite 5.5A and Dominion must work together to implement system under this certification and must comply with the conditions found in this report, and any directives issued by the Secretary of the Commonwealth regarding the use of this System, in accordance with Section 1105-A(a)-(b) of the Election Code, 25 P.S. § 3031.5(a)-(b). Dominion must ensure that future releases of the voting system with enhanced security and accessibility features are presented for approval to the Secretary.

NN.   Dominion must work with counties and Department to ensure that the system can integrate with the Pennsylvania Depart of State's Election Night Reporting (ENR) system. In addition, pursuant to the Directive on Electronic Voting Systems issued by the Secretary of the Commonwealth on August 8, 2006, the Directive Concerning the Use, Implementation and Operation of Electronic Voting Systems by the County Boards of Elections issued on June 9, 2011 and section 1105-A(d) of the Pennsylvania Election Code, 25 P.S. § 3031.5(d), this certification and approval is valid only for Democracy Suite 5.5A. If the vendor or a County Board of Elections makes any changes to the Democracy Suite 5.5A Voting System subsequent to the date of its examination, it must immediately notify both the Pennsylvania Department of State and the relevant federal testing authority or laboratory, or their successors. Failure to do so may result in the decertification of the Democracy Suite 5.5A Voting System in the Commonwealth of Pennsylvania.

V. Recommendations

A.   All jurisdictions implementing Democracy Suite 5.5A Voting System should ensure that the system is correctly set up pursuant to all the recommendations of the Directive Concerning the Use, Implementation and Operations of Electronic Voting Systems by the County Boards of Elections issued by the Secretary of the Commonwealth on June 9, 2011 and Guidance on Electronic Voting System Preparation and Security, September 2016.

B.   All jurisdictions implementing Democracy Suite 5.5A should take appropriate steps to ensure that voter education is part of the implementation plan.

C.   All jurisdictions implementing the Democracy Suite 5.5A should ensure that precinct election officials and poll workers receive appropriate training and are comfortable using the system.

D.   All jurisdictions considering purchase of the Democracy Suite 5.5A should review the System Limits as mentioned in the EAC certification scope.

E.   The Secretary recommends that Dominion and counties work with the Department on any changes to their voting equipment including, but not limited to, purchase and upgrades.

F.   Secretary recommends in-house ballot definition activities at county location whenever possible. If an external vendor location is used the county should implement checks and balances to ensure that election data including ballot definition files and audit logs stored on devices outside of the county is protected from unauthorized access.

G.   Secretary recommends configuring the election with only one contest being displayed on each screen presented to the voter on ICX. This is to ensure that all screens presented to the voter are similar and voters don't need to adapt to the situation that there may be multiple contests displayed on a screen.

51

VI.   Conclusion

As a result of the examination, and after consultation with the Department's staff and the Examiners, the Secretary of the Commonwealth concludes that the Democracy Suite 5.5A can be safely used by voters at elections as provided in the Pennsylvania Election Code and meets all of the requirements set forth in the Code, **provided the voting system is implemented with the conditions listed in Section IV of this report**. Accordingly, the Secretary certifies Democracy Suite 5.5A for use in this Commonwealth.

The ICX can accommodate 4 to 5 voters using assistive devices per hour or around 19 voters per hour when used as the primary voting system depending on the size of the ballot. The ICP precinct scanner can serve 30 voters per hour depending on the length of the ballot.

VVSG 2005 VER. I

EAC CERTIFIED

United States Election Assistance Commission

Certificate of Conformance

Dominion Voting Systems
Democracy Suite 5.5-A

The voting system identified on this certificate has been evaluated at an accredited voting system testing laboratory for conformance to the *Voluntary Voting System Guidelines Version 1.0 (VVSG 1.0)*. Components evaluated for this certification are detailed in the attached Scope of Certification document. This certificate applies only to the specific version and release of the product in its evaluated configuration. The evaluation has been verified by the EAC in accordance with the provisions of the EAC *Voting System Testing and Certification Program Manual* and the conclusions of the testing laboratory in the test report are consistent with the evidence adduced. This certificate is not an endorsement of the product by any agency of the U.S. Government and no warranty of the product is either expressed or implied.

Executive Director

Scope of Certification Attached

Product Name: Democracy Suite

Model or Version: 5.5-A

Name of VSTL: SLI Compliance

EAC Certification Number: DVS-DemSuite5.5-A

Date Issued: January 30, 2019

Manufacturer: *Dominion Voting Systems (DVS)*   **Laboratory:** *SLI Compliance*
System Name: *Democracy Suite 5.5-A*   **Standard:**   *VVSG 1.0 (2005)*
Certificate: *DVS-DemSuite5.5-A*   **Date:**   *January 30, 2019*

Scope of Certification

This document describes the scope of the validation and certification of the system defined above. Any use, configuration changes, revision changes, additions or subtractions from the described system are not included in this evaluation.

Significance of EAC Certification

An EAC certification is an official recognition that a voting system (in a specific configuration or configurations) has been tested to and has met an identified set of Federal voting system standards. An EAC certification is **not**:

- An endorsement of a Manufacturer, voting system, or any of the system's components.
- A Federal warranty of the voting system or any of its components.
- A determination that a voting system, when fielded, will be operated in a manner that meets all HAVA requirements.
- A substitute for State or local certification and testing.
- A determination that the system is ready for use in an election.
- A determination that any particular component of a certified system is itself certified for use outside the certified configuration.

Representation of EAC Certification

Manufacturers may not represent or imply that a voting system is certified unless it has received a Certificate of Conformance for that system. Statements regarding EAC certification in brochures, on Web sites, on displays, and in advertising/sales literature must be made solely in reference to specific systems. Any action by a Manufacturer to suggest EAC endorsement of its product or organization is strictly prohibited and may result in a Manufacturer's suspension or other action pursuant to Federal civil and criminal law.

System Overview:

The D-Suite 5.5-A Voting System is a paper-based optical scan voting system with a hybrid paper/DRE option consisting of the following major components: The Election Management System (EMS), the ImageCast Central (ICC), the ImageCast Precinct (ICP), and the ImageCast X ballot marking device (BMD). The D-Suite 5.5-A Voting System configuration is a modification from the EAC approved D-Suite 5.5 system configuration.

Language capability:

System supports Alaska Native, Apache, Bengali, Chinese, English, Eskimo, Filipino, French, Hindi, Japanese, Jicarilla, Keres, Khmer, Korean, Navajo, Seminole, Spanish, Thai, Towa, Ute, Vietnamese, and Yuman.

Democracy Suite 5.5-A System Diagram

DEMOCRACY SUITE® - System High-Level Block Diagram
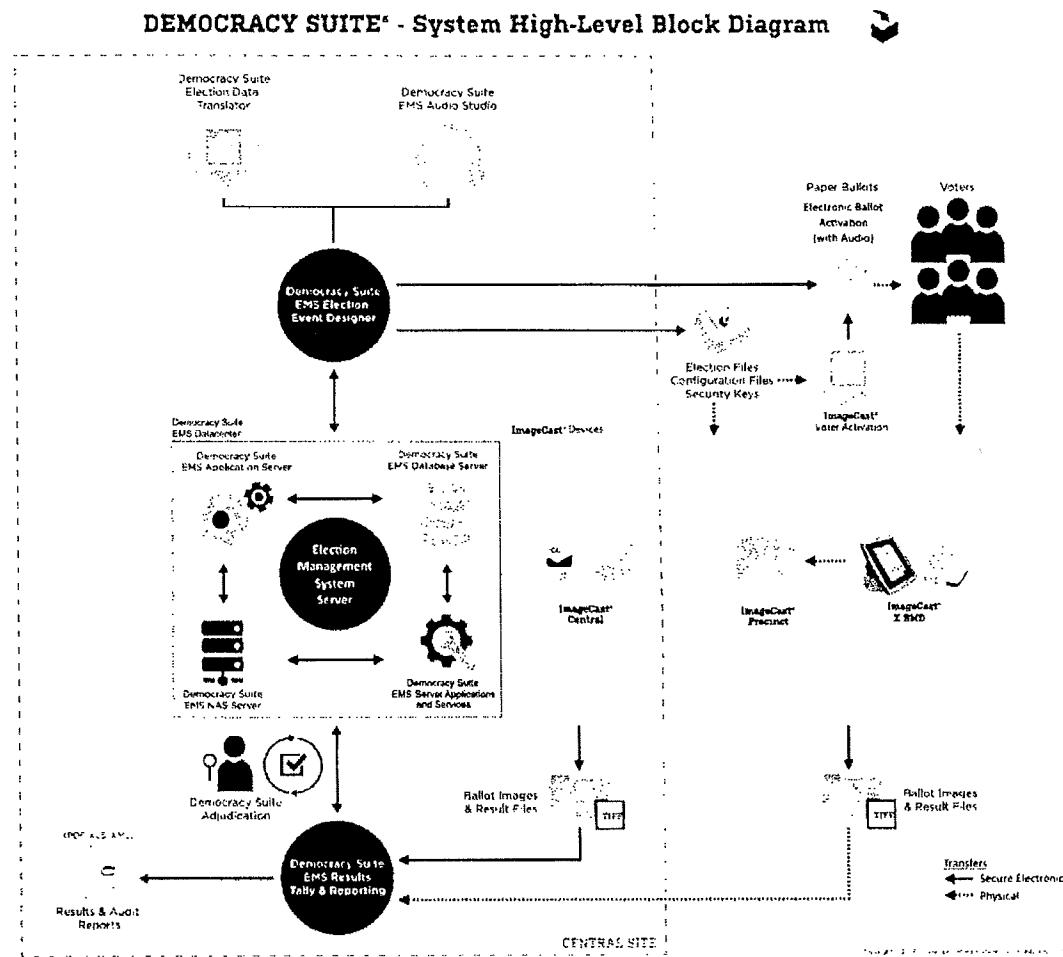
Components Included:

This section provides information describing the components and revision level of the primary components included in this Certification.

Voting System Software Components.

System Component	Software or Firmware Version	Operating System or COTS	Comments
EMS Election Event Designer (EED)	5.5.12.1	Windows 10 Pro	EMS
EMS Results Tally and Reporting (RTR)	5.5.12.1	Windows 10 Pro	EMS
EMS Application Server	5.5.12.1	Windows Server 2012 R2 Windows 10 Pro	EMS
EMS File System Service (FSS)	5.5.12.1	Window 10 Pro	EMS
EMS Audio Studio (AS)	5.5.12.1	Windows 10 Pro	EMS
EMS Data Center Manager (DCM)	5.5.12.1	Windows Server 2012 R2 Windows 10 Pro	EMS
EMS Election Data Translator (EDT)	5.5.12.1	Windows 10 Pro	EMS
ImageCast Voter Activation (ICVA)	5.5.12.1	Windows 10 Pro	EMS
EMS Adjudication (ADJ)	5.5.8.1	Windows 10 Pro	EMS
EMS Adjudication Services	5.5.8.1	Windows 10 Pro	EMS
Smart Card Helper Service (SCHS)	5.5.12.1	Windows 10 Pro	EMS
Election Firmware	5.5.3-0002	uClinux	ICP
Firmware Updater	5.5.3-0002	uClinux	ICP
Firmware Extractor	5.5.3-0002	uClinux	ICP
Kernel (uClinux)	5.5.3-0002	Modified COTS	ICP
Boot Loader (COLILO)	20040221	Modified COTS	ICP
Asymmetric Key Generator	5.5.3-0002	uClinux	ICP
Asymmetric Key Exchange Utility	5.5.3-0002	uClinux	ICP
Firmware Extractor (Technician Key)	5.5.3-0002	uClinux	ICP
ImageCast Central Application	5.5.3.0002	Windows 10 Pro	ICC
ICX Application	5.5.10.30	Android 5.1 (ICX Prime)	ICX

Voting System Platform:

System Component	Version	Operating System or COTS	Comments
Microsoft Windows Server	2012 R2 Standard	Unmodified COTS	EMS Server SW Component
Microsoft Windows	10 Professional	Unmodified COTS	EMS Client/Server SW Component
.NET Framework	3.5	Unmodified COTS	EMS Client/Server SW Component
Microsoft Visual J#	2.0	Unmodified COTS	EMS Client/Server SW Component
Microsoft Visual C++ 2013 Redistributable	2013	Unmodified COTS	EMS Client/Server SW Component
Microsoft Visual C++ 2015 Redistributable	2015	Unmodified COTS	EMS Client/Server SW Component
Java Runtime Environment	7u80	Unmodified COTS	EMS Client/Server SW Component
Java Runtime Environment	8u144	Unmodified COTS	EMS Client/Server SW Component

System Component	Version	Operating System or COTS	Comments
Microsoft SQL Server 2016Standard	2016 Standard	Unmodified COTS	EMS Client/Server SW Component
Microsoft SQL Server 201 Service Pack 2	2016 SP1	Unmodified COTS	EMS Client/Server SW Component
Microsoft SQL Server 2016 SP1 Express	2016 SP1	Unmodified COTS	EMS Client/Server SW Component
Cepstral Voices	6.2.3.801	Unmodified COTS	EMS Client/Server SW Component
Arial Narrow Fonts	2.37a	Unmodified COTS	EMS Client/Server SW Component
Maxim iButton Driver	4.05	Unmodified COTS	EMS Client/Server SW Component
Adobe Reader DC	AcrobatDC	Unmodified COTS	EMS Client/Server SW Component
Microsoft Access Database Engine	2010	Unmodified COTS	EMS Client/Server SW Component
Open XML SDK 2.0 for Microsoft Office	2.0	Unmodified COTS	EMS Client/Server SW Component
Infragistics NetAdvantage Win Forms 2011.1	2011 Vol. 1	Unmodified COTS	EMS SW Platform
Infragistics NetAdvantage WPF 2012.1	2012 Vol. 1	Unmodified COTS	EMS SW Platform
TX Text Control Library for .NET	16.0	Unmodified COTS	EMS SW Platform
SOX	14.3.1	Unmodified COTS	EMS SW Platform
NLog	1.0.0.505	Unmodified COTS	EMS SW Platform
iTextSharp	5.0.5	Unmodified COTS	EMS SW Platform
OpenSSL	1.0.2K	Unmodified COTS	EMS SW Platform
OpenSSL FIPS Object Module	2.0.14 (Cert 1747)	Unmodified COTS	EMS SW Platform
SQLite	1.0.103.0	Unmodified COTS	EMS SW Platform
Lame	3.99.4	Unmodified COTS	EMS SW Platform
Speex	1.0.4	Unmodified COTS	EMS SW Platform
Ghostscript	9.04	Unmodified COTS	EMS SW Platform
One Wire API for .NET	4.0.2.0	Unmodified COTS	EMS SW Platform
Avalon-framework-cvs-20020806	20020806	Unmodified COTS	EMS SW Platform
Batik	0.20-5	Unmodified COTS	EMS SW Platform
Fop	0.20-5	Unmodified COTS	EMS SW Platform
Microsoft Visual J# 2.0 Redistributable Package – Second Edition (x64)	2.0	Unmodified COTS	EMS SW Platform
Entity framework	6.1.3	Unmodified COTS	EMS SW Platform
Spreadsheetlight	3.4.3	Unmodified COTS	EMS SW Platform
Open XML SDK 2.0 for Microsoft Office	2.0.5022.0	Unmodified COTS	EMS SW Platform
Open SSL	1.0.2K	Unmodified COTS	ICP
OpenSSL FIPS Object Module	2.0.10 (Cert 1747)	Unmodified COTS	ICP
Zlib	1.2.3	Unmodified COTS	ICP
uClinux	20070130	Modified COTS	ICP
Google Text-to-Speech Engine	3.11.12	Unmodified COTS	ICX SW
Zxing Barcode Scanner	4.7.5	Modified COTS	ICX SW
SoundTouch	1.9.2	Modified COTS	ICX SW
ICX Prime Android 5.1.1 Image	0405	Modified COTS	ICX SW
ICX Classic Android 4.4.4 Image	0.0.98	Modified COTS	ICX SW
OpenSSL FIPS Object Module	2.0.10 (Cert 2473)	Unmodified COTS	ICX SW Build Library

System Component	Version	Operating System or COTS	Comments
OpenSSL	1.0.2K	Unmodified COTS	ICC SW Build Library
OpenSSL FIPS Object Module	2.0.10 (Cert 1747)	Unmodified COTS	ICC SW Build Library
1-Wire Driver (x86)	4.05	Unmodified COTS	ICC Runtime SW
1-Wire Driver (x64)	4.05	Unmodified COTS	ICC Runtime SW
Canon DR-G1130 Driver	1.2 SP6	Unmodified COTS	ICC Runtime SW
Canon DR-G1130 TWAIN Driver	1.2 SP6	Unmodified COTS	ICC Runtime SW
Visual C++ 2013 Redistributable (x86)	12.0.30501	Unmodified COTS	ICC Runtime SW
Machine Configuration File (MCF)	5.5.10.19_20180706	Proprietary	ICX Configuration File
Device Configuration File (DCF)	5.4.01_20170521	Proprietary	ICP and ICC Configuration File

Hardware Components:

System Component	Hardware Version	Proprietary or COTS	Comments
ImageCast Precinct (ICP)	PCOS-320C	Proprietary	Hybrid Precinct Scanner/DRE
ImageCast Precinct (ICP)	PCOS-320A	Proprietary	Hybrid Precinct Scanner/DRE
ICP Ballot Box	BOX-330A	Proprietary	Ballot Box
ICP Ballot Box	BOX-340C	Proprietary	Ballot Box
ICP Ballot Box	BOX-341C	Proprietary	Ballot Box
ICX UPS Inline EMI Filter	1.0	Proprietary	EMI Filter
ICX Tablet (Classic)	aValue 21" Tablet (SID-21V)	COTS	Ballot Marking Device
ICX Tablet (Prime)	aValue 21" Tablet (HID-21V)	COTS	Ballot Marking Device
Server	Dell PowerEdge R630	COTS	Standard Server
Server	Dell PowerEdge R640	COTS	Standard Server
Server	Dell Precision T3420	COTS	Express Server
ICC Workstation HW	Dell OptiPlex 7440 All in One	COTS	
ICC Workstation HW	Dell OptiPlex 9030 All In One	COTS	
ICC Workstation HW	Dell OptiPlex 3050 All In One	COTS	
ICC Scanner	Canon imageFormula DR-G1130	COTS	Central Count Scanner
ICC Scanner	Canon imageFormula DR-M160II	COTS	Central Count Scanner
Client Workstation HW	Dell Precision T3420	COTS	
Client Workstation HW	Dell Latitude E7450	COTS	
Client Workstation HW	Dell Latitude e3480	COTS	
ICX Printer	HP LaserJet Pro Printer M402dn	COTS	
ICX Printer	HP LaserJet Pro Printer M402dne	COTS	
Monitor	Dell Monitor KM632	COTS	
Monitor	Dell Monitor P2414Hb	COTS	
Monitor	Dell Ultrasharp 24" Monitor U2414H	COTS	
CD/DVD Reader	Dell DVD Multi Recorder GP60NB60	COTS	
iButton Programmer	Maxim iButton Programmer DS9490R# with DS1402	COTS	
UPS	APC Smart-UPS SMT1500	COTS	
Network Switch	Dell X1008	COTS	
Network Switch	Dell X1018	COTS	

System Component	Hardware Version	Proprietary or COTS	Comments
Network Switch	Dell X1026	COTS	
Network Switch	Dell PowerConnect 2808	COTS	
Sip and Puff	Enabling Devices Sip and Puff	COTS	
Headphones	Cyber Acoustics ACM-70	COTS	
4-way Joystick Controller	S26	Modified COTS	
Rocker (Paddle) Switch	Enablemart #88906	COTS	
Footswitches	ABLENET Jelly Bean Twist 10033400	COTS	
CF Card Reader	IOGEAR SDHC/microSDHC 0U51USC410	COTS	
CF Card Dual-Slot Reader	Lexar USB 3.0	COTS	
CF Card Reader	Hoodman Steel USB 3.0 102015	COTS	
CF Card Reader	Lexar Professional CFR1	COTS	
CF Card Reader	Kingston FCR-HS4	COTS	
ATI	ATI handset	Proprietary	
ATI	ATI-USB handset	Proprietary	
ACS PC-Linked Smart Card Reader	ACR39U	COTS	

System Limitations

This table depicts the limits the system has been tested and certified to meet.

Characteristic	Limiting Component	Limit	Comment
Ballot positions	Ballot	292*/462**	Both
Precincts in an election	EMS	1000; 250	Standard; Express
Contests in an election	EMS	1000; 250	Standard; Express
Candidates/Counters in an election	EMS	10000; 2500	Standard; Express
Candidates/Counters in a precinct	Ballot	240*/462**	Both
Candidates/Counters in a tabulator	Tabulator	10000; 2500	Standard; Express
Ballot Styles in an election	Tabulator	3000; 750	Standard; Express
Ballot IDs in a tabulator	Tabulator	200	Both
Contests in a ballot style	Ballot	38*/156**	Both
Candidates in a contest	Ballot	240*/231**	Both
Ballot styles in a precinct	Tabulator	5	Both
Number of political parties	Tabulator	30	Both
"vote for" in a contest	Ballot	24*/30**	Both
Supported languages in an election	Tabulator	5	Both
Number of write-ins	Ballot	24*/462**	Both

* Reflects the system limit for a ballot printed in landscape.

** Reflects the system limit for a ballot printed in portrait.

Functionality

2005 VVSG Supported Functionality Declaration

Feature/Characteristic	Yes/No	Comment
Voter Verified Paper Audit Trails		
VVPAT	NO	
Accessibility		
Forward Approach	YES	
Parallel (Side) Approach	YES	
Closed Primary		
Primary: Closed	YES	
Open Primary		
Primary: Open Standard (provide definition of how supported)	YES	
Primary: Open Blanket (provide definition of how supported)	YES	
Partisan & Non-Partisan:		
Partisan & Non-Partisan: Vote for 1 of N race	YES	
Partisan & Non-Partisan: Multi-member ("vote for N of M") board races	YES	
Partisan & Non-Partisan: "vote for 1" race with a single candidate and write-in voting	YES	
Partisan & Non-Partisan "vote for 1" race with no declared candidates and write-in voting	YES	
Write-In Voting:		
Write-in Voting: System default is a voting position identified for write-ins.	YES	
Write-in Voting: Without selecting a write in position.	NO	
Write-in: With No Declared Candidates	YES	
Write-in: Identification of write-ins for resolution at central count	YES	
Primary Presidential Delegation Nominations & Slates:		
Primary Presidential Delegation Nominations: Displayed delegate slates for each presidential party	YES	
Slate & Group Voting: one selection votes the slate.	YES	
Ballot Rotation:		
Rotation of Names within an Office; define all supported rotation methods for location on the ballot and vote tabulation/reporting	YES	Equal time rotation
Straight Party Voting:		
Straight Party: A single selection for partisan races in a general election	YES	
Straight Party: Vote for each candidate individually	YES	
Straight Party: Modify straight party selections with crossover votes	YES	
Straight Party: A race without a candidate for one party	YES	
Straight Party: "N of M race (where "N">1)	YES	
Straight Party: Excludes a partisan contest from the straight party selection	YES	
Cross-Party Endorsement:		
Cross party endorsements, multiple parties endorse one candidate.	YES	
Split Precincts:		
Split Precincts: Multiple ballot styles	YES	

Feature/Characteristic	Yes/No	Comment
Split Precincts: P & M system support splits with correct contests and ballot identification of each split	YES	
Split Precincts: DRE matches voter to all applicable races.	YES	
Split Precincts: Reporting of voter counts (# of voters) to the precinct split level; Reporting of vote totals is to the precinct level	YES	
Vote N of M:		
Vote for N of M: Counts each selected candidate, if the maximum is not exceeded.	YES	
Vote for N of M: Invalidates all candidates in an overvote (paper)	YES	
Recall Issues, with options:		
Recall Issues with Options: Simple Yes/No with separate race/election. (Vote Yes or No Question)	YES	
Recall Issues with Options: Retain is the first option, Replacement candidate for the second or more options (Vote 1 of M)	NO	
Recall Issues with Options: Two contests with access to a second contest conditional upon a specific vote in contest one. (Must vote Yes to vote in 2nd contest.)	NO	
Recall Issues with Options: Two contests with access to a second contest conditional upon any vote in contest one. (Must vote Yes to vote in 2nd contest.)	NO	
Cumulative Voting		
Cumulative Voting: Voters are permitted to cast, as many votes as there are seats to be filled for one or more candidates. Voters are not limited to giving only one vote to a candidate. Instead, they can put multiple votes on one or more candidate.	NO	
Ranked Order Voting		
Ranked Order Voting: Voters can write in a ranked vote.	NO	
Ranked Order Voting: A ballot stops being counting when all ranked choices have been eliminated	NO	
Ranked Order Voting: A ballot with a skipped rank counts the vote for the next rank.	NO	
Ranked Order Voting: Voters rank candidates in a contest in order of choice. A candidate receiving a majority of the first choice votes wins. If no candidate receives a majority of first choice votes, the last place candidate is deleted, each ballot cast for the deleted candidate counts for the second choice candidate listed on the ballot. The process of eliminating the last place candidate and recounting the ballots continues until one candidate receives a majority of the vote	NO	
Ranked Order Voting: A ballot with two choices ranked the same, stops being counted at the point of two similarly ranked choices.	NO	
Ranked Order Voting: The total number of votes for two or more candidates with the least votes is less than the votes of the candidate with the next highest number of votes, the candidates with the least votes are eliminated simultaneously and their votes transferred to the next-ranked continuing candidate.	NO	

Feature/Characteristic	Yes/No	Comment
Provisional or Challenged Ballots		
Provisional/Challenged Ballots: A voted provisional ballots is identified but not included in the tabulation, but can be added in the central count.	YES	
Provisional/Challenged Ballots: A voted provisional ballots is included in the tabulation, but is identified and can be subtracted in the central count	NO	
Provisional/Challenged Ballots: Provisional ballots maintain the secrecy of the ballot.	YES	
Overvotes (must support for specific type of voting system)		
Overvotes: P & M: Overvote invalidates the vote. Define how overvotes are counted.	YES	Overvotes cause a warning to the voter and can be configured to allow voter to override.
Overvotes: DRE: Prevented from or requires correction of overvoting.	YES	
Overvotes: If a system does not prevent overvotes, it must count them. Define how overvotes are counted.	YES	If allowed via voter override, overvotes are tallied separately.
Overvotes: DRE systems that provide a method to data enter absentee votes must account for overvotes.	N/A	
Undervotes		
Undervotes: System counts undervotes cast for accounting purposes	YES	
Blank Ballots		
Totally Blank Ballots: Any blank ballot alert is tested.	YES	Precinct voters receive a warning; both precinct and central scanners will warn on blank ballots.
Totally Blank Ballots: If blank ballots are not immediately processed, there must be a provision to recognize and accept them	YES	Blank ballots are flagged. These ballots can be manually examined and then be scanned and accepted as blank; or precinct voter can override and accept.
Totally Blank Ballots: If operators can access a blank ballot, there must be a provision for resolution.	YES	Operators can examine a blank ballot, re-mark if needed and allowed, and then re-scan it.
Networking		
Wide Area Network – Use of Modems	NO	
Wide Area Network – Use of Wireless	NO	
Local Area Network – Use of TCP/IP	YES	Client/server only
Local Area Network – Use of Infrared	NO	

Feature/Characteristic	Yes/No	Comment
Local Area Network – Use of Wireless	NO	
FIPS 140-2 validated cryptographic module	YES	
Used as (if applicable):		
Precinct counting device	YES	ImageCast Precinct
Central counting device	YES	ImageCast Central

Baseline Certification Engineering Change Orders (ECO)

There are no ECOs applied to this modification that are not certified as part of the baseline Democracy Suite 5.5 voting system.

Attachment B – Accessibility Examination Findings and Recommendations

A) Top problems and Recommendations as listed in the accessibility examiner's report

PDF

Top problems -
Dominion.pdf

B) All observations from Accessibility Examination

PDF

All
observations.pdf

C) Other Recommendations for Deployment from Accessibility Examiner report

PDF

Other issues and
recommendations fc

D) Top positives

PDF

Top positives -
Dominion.pdf

Top problems

The following discusses the problems that surfaced during the expert examinations and voter/poll worker observations with the Dominion Voting ICX ballot marking system.

Testing identified five problems that could reduce the ability of people with disabilities to vote independently and privately on the ICX voting machine.

1. Privacy and Independence

What Happened?

The ICX voting system, as it was configured during certification testing, presents two impediments to voters with disabilities voting privately and independently.

- **Machine set up.** The ICX has a 27-inch, portrait oriented diagonal display, which is very large and produces very clear print. Also, as with most modern displays, the screen can be viewed at wide angles without distortion. Also, the machine and printer take up a sizable operating footprint. Which means in most voting booths, the screen will sit near the front of the booth in order to fit.

- **Voter check-in and disclosure.** With the ICX system, voters receive a voter "smart card" from the check-in table that contains all the information the machine needs to pull up the correct ballot. There are many ways a county could implement this system, but it was clear that a card would need to be created for each voter in advance or on demand. There were two types of voter cards: standard and accessibility devices enabled. The second type of card must be inserted by a poll worker to activate the accessibility device options screen, where the preferred device, such as the tactile keypad, switch input, or audible output is chosen. Then, the preferred device is given to the voter.

- **Accommodation screen.** The accommodation selection screen is available only once in the voting process, so it is not possible to try

different accommodations to see which would work best. And, once the voter has begun voting, they cannot change the type of accommodation without canceling the ballot and starting again.

- o **Really only two options.** The accommodation screen presents four choices: Audio-Tactile Interface (ATI), Paddles, Sip and Puff, or Audio/Visual mode. While this suggests that there are four modes of interaction, there are, in fact, only two. The ATI, Paddles, and Sip and Puff selections produce identical behavior. The Paddles and Sip and Puff choices, from the point of view of the voting machine, are identical, as would be any user-provided switch input. In all three methods, the machines "listens" for input from the switches and provides auditory feedback. In the fourth choice, Audio/Visual mode, the system provides auditory navigation and feedback, but does not listen for switch input.

- o **Active touchscreen, all the time.** In all four modes, the touch-screen remains active. When the voter touches a control for the first time, its purpose and content is announced, but not selected. A second touch selects the control and activates it (if a button). On second touch, the content of the choice is repeated aloud, which allows a voter with low-vision to explore the screen by touching various controls and hearing their function without accidentally making choices.

  This behavior for various switch and audio modes is not well implemented. A person who elects to use the switch input will not touch the screen for control, as that is beyond their capability (hence the use of the switch interface). However, if a switch user needs assistance from another person, the double-touch function means the poll worker or aide must touch each choice twice. In these cases, the two-step selection is an unnecessary burden. Since the switch user (blind or sighted) would be using a personal listening device such as the provided headphones or personal headset, the selected choice being read prior to the selection would not be apparent to the

person helping, and learning the two-step selection could be difficult.

Why is this a problem?

The poll worker setup and required voter disclosure are problems for three reasons.

- **Bright and clear.** Anyone within 10 feet of a booth, including in nearby booths, can observe the selections of any voter.

- **Voters cannot independently choose and initiate their preferred voting method.** For a voter to have access to the assistive devices they must declare their need at sign-in, and receive a different activation card than that provided to non-disabled voters. In some cases, such as blindness or mobility impairment, the disability is overt, and there is no loss of confidentiality. When such a voter enters the polling place, their need for accommodation is readily apparent, and there is no additional exposure from requesting an accommodations card (and generally the assistance of a poll worker in setting up the machine).

  Because a poll worker must initiate the accommodations, and then walk away, there's no method where the voter could do this by themselves and then test the different devices.

- **Social stigma and privacy.** There are other types of disability that are not readily apparent, and those living with these limitations would also benefit from the available accommodations. For example, voters with low literacy or cognitive impairment would benefit from the audio/visual assistive option, but might not understand that the accessibility options can help them vote more effectively, or they may not wish to reveal their status to the poll workers and the community. The ICX voting machine requires this disclosure to activate the accommodations.

Recommendations

The recommendation for the physical privacy concern is relatively straightforward. Counties will need to think about how a polling location is set up. Keeping the open side of the voting booth close to a wall and ensuring adequate clearance around the voting machine can help. Also, exploring different voting booth manufacturers and types. One that is deeper and allowed the machine to be pushed back into the booth could provide enough side-to-side privacy.

A county choosing this machine will have to do at least two things *before* Election Day to ensure poll workers and voters are successful.

- **Poll Worker accessibility training.** Counties can create a poll worker accessibility training component that gives poll workers tools to effectively help voters with disabilities. Counties that already have this type of program can evaluate it against this machine's requirements. Such training programs could include ways to identify voters who may need assistance, how to appropriately ask a voter if they need assistance, and how to assist a voter once identified.

- **Voter education and demonstrations.** Officials can create voters with disabilities education and demonstration events around the county. Here, voters can learn how to use the new machine, and the county can demonstrate all the machine's accessibility features. While demonstrating them, officials can give examples of who could benefit from using each assistive device, and especially include examples of voters most would not immediately identify as having a disability. For example, an older voter with sight problems might benefit from the additional audio instructions. Or a diabetic with neuropathy in their hands may prefer to use the dual-switch paddles. Both examples of voters may not have known the options and devices were available before.

A strong two-pronged training and education program will help poll workers be more comfortable with assisting voters with disabilities. Having who know all of the accessibility options and well-trained poll workers will make voters feel more comfortable asking for assistance on Election Day.

2. Audio Quality, Instructions, and Feedback

The ICX voting machine had a number of problems with the audio quality, instructions, and feedback.

What happened?

The ICX machine uses two distinct voices for its audio interface.

- **Instructions.** One voice, used for instructions, appears to be prerecorded synthesized voice that will remain constant across elections. This voice is well articulated and clear, but was considered "harsh," "not good," and "rinky-dink" by voters who were more experienced with the state-of-the-art voices provided on their personal devices. The pacing and phrasing of this voice meant it was difficult to know when a sentence started and ended. For a brief announcement, this voice would be acceptable, but the long-term use was a problem (see below).

- **Ballot content.** The second voice uses text-to-speech and reads the content of the ballot. Unlike the pre-recorded voice, this voice is "live," somewhat "fuzzier," and less harsh than the instructional voice.

As delivered, these two voices had five problems, one of which was corrected before the voters arrived.

- **Volume difference.** The first, correctable, issue was that the voices started at quite different volumes. When the instructional voice was set to a comfortable level, the content voice was nearly inaudible. This problem was fixed by an adjustment by the manufacturer, but should have been tested before delivery.

- **Rate of speech and voice quality.** The system allowed voters to change the rate of speech, which is common for audio assistive devices. The range of speech rates was very different between the two voices. The instructional voice could be slowed by as much as 50%, and accelerated by approximately 200%. The content voice, by contrast, could be sped up by about 600%. An increase in the rate of the instructional voice from 100 words per minute to 110 words per

minute might result in a change of the content voice from 100 wpm to 200 words per minute. After the initial orientation to the machine, voters were more interested in the information provided by the content voice. These two voices need to respond similarly to the settings.

- **Audio and tactile keypad.** At the top of the keypad, there are controls to adjust the rate and volume of the auditory feedback. These buttons are convex on top to indicate increasing, or concave to indicate decreasing the assigned function. Below this are five buttons: a right-left pair, the select button, and an up-down pair. At the bottom of the keypad is a "Help" button that reaches from side to side.

  On the lower edge of the keypad are ports for headphones or access switches. These ports are physically identical (3.5mm phono jacks), and have nearly invisible raised labels (black on black). There is no Braille marking on the ports.

  The tactile keypad's navigation buttons do not have a unique function in this voting system.

  - The yellow, left and right buttons and the blue, up and down buttons do exactly the same thing. During the ATI instructions, this was not stated. The instructions described the yellow-and blue-buttons as having different functions. At each step, the buttons were described by color, shape, and function: "the yellow, left-arrow button to move left," or "the blue up-arrow button to move up."

  - The single exception to this was the select button. In the Help instructions, this was identified as the "red, x-shaped select button." However, throughout the audio narration on the machine, this was only described as the "red select button." Several blind voters commented, "Why do I care what color it is?" When it was explained that a person with low vision might use this interface, and might be able to use the color as an aid, they were accepting, but the select button, being used so

often, should have been identified, using this logic, as x-shaped rather than simply "red."

- **Persistence and repetition.** The phrasing of audio commands should place the most important information first. This allows the voter to attend when the narration of interest, and think about other things when it is not.

  - o The same instructions played every time a voter pressed a button in the same contest area. The instructions only changed when they moved to a new contest area or page. Also, if the voter paused to think about the next action, the instructions would immediately start to play again. Voters stopped thinking about voting to listen to the voice to ensure no new information was available. After voters figured out the pattern, they stopped listening to the instructions altogether.

- **Instructions content.** The content instructions are also long, confusing, or unhelpful.

  - o The audio instructions for the Dominion system repeatedly said "Use the yellow, right-arrow button or the blue down arrow button to move to the next item." This long text was confusing. More efficient wording might simply ignore one set of buttons, for example, "To move to the next item, use the blue down-arrow button."

  - o The introduction to the write-in screen says that you can write-in a candidate of your choice, but does not provide guidance on how to do that. This disturbed even the sighted voters, but every blind voter had to be cued to move beyond the box announced as "Write-in candidate, blank" to find the keyboard.

  Sometimes the voting instructions on the screen are poorly worded.

  - o The screen to select a straight party vote, the instructions say "You may select the party of your choice by selecting the party of your choice."

Why is this a problem?

To some extent, the audio instructions and content feature of the Dominion system may suffer from an "uncanny valley" where it is close enough to good to be annoying, though it is actually better than the feedback from some of the other machines we have evaluated.

Blind users typically want their text-to-speech voices to speak at rates above 400 words per minute, so that they can listen at the same rate sighted people can read. Many blind individuals read at speeds in excess of 600 words per minute, and up to 1000 words per minute (the limit of current technology). People with cognitive limitations such as auditory processing disorders may need the voice to speak more slowly, to give them time to understand it.

Voices designed for screen reading do not necessarily sound like human voices, but remain understandable over a wide range of speeds. To accomplish this, the components of voice that carry information are identified, and the filler sounds between those components are stretched or shortened to change the overall speech rate without loss of intelligibility. People who routinely listen to synthetic voices expect this.

The voices used in the Dominion voting machine are not this sophisticated. To increase speech rate, it appears that they simply slice sections from the sound stream. To slow the voice down, they insert silence at intervals in the sound stream. This approach is "effective" for compressions and stretches of 10 to 20%, as the human brain can fill in the blanks fairly effectively. However, the Dominion system attempts to use this technique with slowing to as little as 50% of the speech rate, and increasing rate by several hundred percent.

The use of two audio voices for instructions and ballot content in and of itself is not a problem (in fact, it meets the VVSG requirement that they be different). But Dominion's implementation of the voices is a problem for at least two reasons.

- **Election Day Ready.** The ICX seems to have a lot of configuration points, which could be a good thing for counties. However, when many of the settings, like the disparate volumes between instructions and content speech, are not usable out-of-the-box, some counties

may not know that they need to make those changes for an option to be usable.

- **Cognitive overhead.** Voters had to concentrate excessively to understand what was being said. At the lower three speed settings, the instructional voice was noticeably broken up, and at the highest two settings the gaps made it impossible to process what was being said.

  When voters have to interpret poorly written instructions, it means they are not thinking about voting. This is made harder for voters using the audio when the quality, rate, and phrasing mean they are spending more time figuring out how to use the machine than they are on which candidate is best for the contest.

Recommendations

Counties choosing this machine can ensure that they:

- Test the audio rates and volumes before deployment to make sure they are usable for both blind voters and others who might use the audio.

- Train poll workers well on the potential issues and questions voters might have about using the audio while voting.

- Provide community demonstrations so voters can practice with the machine. Voting on Election Day may be smoother if they know what to expect.

Also, if the audio style and content is configurable, counties should ask the vendor to do the following:

- **Use better voices.** Many of the blind voters demonstrated the voices they use on their personal assistive devices, and explained why they were better. Much better voices than those on the tested system are available for purchase or license. The vendor could provide a synthetic voice that is designed for high compression levels such as those used in commercial screen readers or cell phones.

- **Include verbosity control and contextual help.** The blind voters all indicated that they would prefer some verbosity control on the audio instructions, or changing the level and wordiness of the help as needed. In the initial orientation, the full names could be used. Once the voter is oriented, though, this could be contracted to "Use the arrows to move forward or back." If the voter got confused, the Help button on the ATI could be configured to provide more detailed instructions about the current screen.

3. The Write-In Process

The write-in screen and process presented two problems for voters using the audio assistance.

What happened?

When visually choosing to write in a candidate on the ICX, the voter enters the write-in screen and is presented with a text box, where the write-in name will appear, editing buttons ("Clear all" and "Delete"). Below this is an on-screen keyboard in alphabetical order to enter the name of the chosen candidate. At the bottom of the screen is a button to confirm the write-in and return to the ballot. This all makes sense for a sighted voter because the layout is clear.

- **No instructions.** There were very few instructions for sighted voters, but the layout of the screen made use self-explanatory for everyone in this test. The audio had no additional instructions beyond "Please enter your write in candidate." Then when the voter navigated to the next option, they only heard the voice say the text box was empty. Voters became caught in this area for a long time. The "Help" button on the tactile keypad only gave voters instructions on how to use the tactile keypad.

  All of the blind voters needed facilitator assistance to successfully write in a candidate. Each voter had trouble moving beyond the write-in name box. But once they advanced to, and heard, "A," they rapidly and generally accurately typed the name of the write-in candidate. At intervals, the users *could* navigate to the write-in name box to hear

their entry spelled back to them, then return to typing. None of our blind voters discovered this capability.

- **Editing Problems.** The Dominion ICX had implementation problems with editing a name once it had been entered and using the audio assistance.

  - o **Deleting.** The only option for editing an error in name entry is to delete letters or the entire name and start from scratch. For sighted voters, this makes sense visually. They can see the letters disappearing and can easily see what letters remain. For blind voters using the audio, each letter is announced when typed, but when deleted, the key announces only "Delete," and not what has been deleted.

  - o **Repeating too soon.** If the voter stops to consider what they are doing while editing a name, the ICX repeats the last audio instruction given. While this is not ordinarily more than an annoyance, in text entry it can be challenging. If the name being written in has a double letter, and the user pauses to think about the spelling of the name, the system will repeat the last instruction, "You selected 'M'." If this occurs as the user presses the select key to double the "M," it is not clear whether a second "M" has been typed, or if the audio has just repeated the previous letter. The user must navigate to the name box to hear the name spelled out to find out how many letter "Ms" have been typed. (This process is not described in the audio instructions, and must be discovered by the voter.)

  - o **Does not voice the "Space."** The "space" character between names is not voiced. A blind voter may have forgotten to enter a space, but would not know.

  - o **No reentry.** True for all voters: If a voter has entered a write-in name, returns to the ballot, and then realizes that the name was misspelled, touching the write-in option again clears the text in the box.

Why is this a problem?

While it is arguable that the write-in process has very little impact in most contests, all of our voters and poll workers were very interested in the usability of the write-in process. And all functions of a voting machine should work effectively for each voter. It does not always have to be the same method, but the outcome should be the same. Not being able to effectively edit a write-in name is a major problem for two reasons.

- An entry the voter thought was cast correctly because there were no audible mistakes might still be voided because of inaudible errors.

- Limited instructions combined with editing problems can lead to voter confusion. Even if they can figure out a method to get the system to voice what is actually in the text box, it takes an inordinate amount of mental resources. Resources that some voters cannot spare and should be reserved to deciding who to vote for.

Recommendation

We recommend the following changes to the write-in system:

- Adjust the on-screen instructions so that the audio reads it.

- Include audio instructions how to navigate to find the keyboard.

- Rework how the system voices deleted characters and the frequency it repeats them.

- Include any and all spaces and special characters in the text box when reading the entry to the voter.

4. Silent/Hidden selection and deselection

What happened?

There were three elements of silent and/or hidden selection and de-selection on the ICX that voters found confusing. In most cases, voters were able to mark their ballot as instructed through trial and error, but in others, they did

not notice changes made by the system and might vote in a way that does not match their intent.

- **Destructive candidate deselection when changing a straight party contest**
  After making a straight party choice, if voters wanted to vote for additional candidates from another party or "scratch" and change party for that contest, the system automatically deselects all of the other pre-marked candidates. In a contest with a short list of candidates, this behavior, dictated by the PA Method, caused confusion, but with persistence voters were able to select the candidates specified in the instructions. When the voters were asked to vote for just one of the three automatically selected candidates, they universally attempted to deselect an unwanted candidate by pressing on that candidate's name. Because of the interpretation of the PA Method, this resulted in confirming the vote for that candidate, instead of deselecting that candidate, as the voters stated they had expected. The voters were, in this case where the changes were evident, able to correct the error and vote as instructed. (Please see more about candidate selection in the next section)

- **When the contest was long, candidates were often de-selected on a different screen, with no notification from the system.** For sighted voters, this automatic change resulted in candidates who had been selected not being voted for as intended by the voter. For audio users, no deselection is voiced at any time.

- **Overvoting protections do not protect audio users**. Once a voter selects the maximum number of candidates in a contest, the system greys out the remaining options. This is a strong protective feature and intuitive for a sighted voter. The sighted voter is able to scan through the remaining candidates and find others who s/he might prefer, and change selections. However, when using the audio assistance, this way of handling overvote protection removes the ability for the system to read the remaining candidates, so a voter may not hear all of the options.

Why is this a problem?

The system relies on voters perceiving the change in selections and understanding why those changes have happened. This is a problem because:

- All voters should have control of all selections.
- Off-screen actions force all voters into problem solving. This is worse for voters using the audio format or a dual switch because navigation is more difficult.
- Voters with cognitive disabilities may be unable to understand what has happened when the interface is unpredictable and/or inconsistent.
- If a voter has to ask for assistance in the middle of the ballot, their privacy and independence are compromised.
- Ultimately, voters may vote in a way they had not intended.

Recommendations

While the machines must comply with the "Pennsylvania Method" of straight party voting, there are ways to fully inform the voter of selection and deselection changes. For example:

- Create meaningful audio feedback messages and confirmation processes to tell voters what is happening—including the number and names of the candidates being deselected. No selection or deselection should ever take place without explicit action or confirmation from the voter. Language should be included like: "If you do X, these voters will be deselected" or "Are you sure you want to...."
- Be consistent and toggle all selections on and off when touched or selected with the tactile keypad, including selections made when the straight party option is active. This is consistent with how selection and deselection works in general and is not destructive.

5. Paper ballot handling

One of the goals of the voting machine upgrade is to allow all voters to vote independently and privately, including verifying their ballot. All paper ballots introduce barriers for voters with low-vision, no-vision, and with limited dexterity.

Most voters appreciated the printed ballot, which allowed a second chance to review the vote before casting. The implementation of the printing and paper-handling of these paper ballots had some issues that limited the ability of voters to use them effectively.

Reading the paper ballot

For the Dominion ICX ballot marking system, the ballot is printed using a separate, off-the-shelf printer on 8.5 x 11-inch cardstock. The cardstock is stored inside the printer next to the tablet. This means that voters do not have to handle a blank ballot before making choices.

It also means that there is no feature to allow a voter to "read back" the ballot by reinserting the printed, completed ballot into the voting system. Three of our five blind voters were able to use app-based print readers on their phone to take a picture of the ballot and read it back to them. This is only an option for voters with this technology. There is no built-in option for all voters.

The paper ballot included alerts and language that was not used on the touchscreen. For example, undervoted contests are called out with "UNDER_VOTE_BY_N" where N is the number of positions still available. The ballot review screen does not do this, which means it is not announced to visually impaired voters using the audio assistance.

Interacting with the ICP ballot scanner

The scanner had both positives and negatives. In general, the ballot scanner does not produce any major accessible voting barriers.

Only one feature stood out and could be considered a positive for voters with disabilities.

- Voters may insert the ballot in any orientation. This provides another layer of privacy and limits the potential failures. However, this was not clear to any of the voters or poll workers. Each asked how to insert it.

The most serious problems are:

- The scanner bed is very shallow so the entire ballot does not fit on it. Only the top third of the page can be rested on the scanner. Voters with no/low use of their hands would rely on assistance for feeding the ballot into the scanner. And the supplied privacy sleeve was of little help because it was not designed for use with these ballots. Some of the test participants commented on these issues.
- There are no audible cues. The scanner did not include robust features to alert voters that their ballot has been cast successfully.
- If the ballot is not perfectly aligned as the scanner begins to grab it, the scanner will spit it back out. If the voter is not ready for this, the ballot will fall to the floor. This is a problem for all voters but potentially very embarrassing and frustrating for those with disabilities.
- There are subtle visual cues from a small screen that notify voters that the scanner is ready, reading a ballot, and finished scanning. These were not available for voters with low or no vision. Also, the quality of the screen is poor. If the voter or poll worker is not directly over the screen, it is difficult or impossible to read.

While the voter does not spend as much time interacting with the ballot scanner as the touchscreen machine, there are barriers for voters with disabilities that can limit voter privacy and independence. If a voter must ask a poll worker for ballot scanning assistance, this increases the likelihood that the poll worker will see how the individual voted.

Recommendations

For the printed ballot layout

- Make the alerts and language on the ballot and touch screen consistent.

For the scanner

- Increase the length of the scanner bed so that the full ballot can sit on it before inserting it into the machine. This will help low mobility and dexterity voters and will catch the ballot if it is inserted incorrectly.

- Make the cues more obvious that the ballot is cast. Large print words or simple images to indicate the scanning steps on the screen, and a stronger visual cue can show that the ballot scanned successfully. Adding a subtle audio cue that the ballot scanned properly would help blind or low vision voters confirm their ballot was cast.

- Train poll worker to assist voters in ways that do not compromise the voter's privacy. This might include having standard instructions for poll workers to use to guide a voter in casting their own ballot, or narrating the poll worker's actions so that the voter understands what the poll worker is doing.

Other issues for deployment

A few other issues produced consistent enough observations to call them out in some detail.

Alerts

Both the poll workers and the voters were uncomfortable with the language of the on-screen warnings.

In general, they felt that warnings were appropriate for conditions that might invalidate a ballot, where "alerts" would be appropriate for acceptable conditions that could be changed.

- **"If left blank, this contest will have implicit choice selections for party [straight party choice]."** One of the most egregious involves any contest that is left blank, but the voter selected a straight party. In this case, the system provides an alert that says "If left blank, this contest will have implicit choice selections for party [straight party choice]." The system does not have an immediate way to straight party vote *and* abstain from a contest, which is a problem in and of itself. But the high-level language in the alert confused most voters and poll workers. And all said that the message needed to change.

- **"Your ballot is valid, but there are warnings."** If a voter does not select a straight party, the review screen first indicates that "Your ballot is valid, but there are warnings." Then, the straight party contest alert indicates that "This contest is blank." The wording of this alert suggests that the straight party selection is a ballot contest rather than a convenience, and that selection is mandatory. In either case, the language is unnecessarily harsh and coercive.

- **"This contest is undervoted!"** If a voter does not select all of the available candidates in a contest, they receive a warning that the contest is undervoted. "Undervoted" is not a clear language term, and is potentially confusing to voters. The warning also suggests that full voting is required.

The language of on-screen or audio "warnings" should be informative, not coercive, and should be in plain language. Where possible, counties should work with the vendor to reconfigure or rewrite these warnings.

Poll Worker Concerns

Poll workers were very excited about the ability of the scanner to tabulate absentee ballots. However, they had some concerns about the touchscreen and general process.

- **Power needs and cords.** Several poll workers commented that the machine included the ballot marking tablet and a separate printer. They were concerned about the power requirements this would present in some of their polling places. Combined with the wires for the headphones and access switches, they felt that the number of cables would be a burden to manage in the polling site.

- **Lots of pieces.** The poll workers were concerned about managing the "parts" of the process. This machine uses activation cards to select the appropriate primary ballot by party, and uses different cards for "normal" versus "accommodated" voting. In polling places that serve more than one precinct, each might have a different ballot. This suggests the need for many types of cards, or new system entirely to manage at the voter check-in area. The scanner also has compact flash cards and security keys. They did not like the idea of complicating the voting process with additional things.

- **Casting the ballot and traffic management.** Poll workers were also worried that the voter must carry the ballot from the voting machine to the scanner and ensuring they actually fed the ballot into the scanner. This has been a common concern from poll workers who do not currently use paper ballots. However, this concern was justified in this instance because of the language on the print ballot screen.

  o When you press the "Print" button at the end of voting, the machine produces a new window with an alert. It has a message "Some warning detected on your ballot. You cannot make any more changes after casting the ballot." Then there are two buttons labeled: "Cast your ballot" and "Review your

choices." To make it worse, the final screen says "Thank you for voting! Your ballot is successfully cast." This language choice is misleading and incorrect. The touchscreen device just creates the ballot and printer prints it. The ballot is not "cast" until it has been scanned by the tabulator.

o   Poll workers became worried that voters may misinterpret these screens and just walk away. Since many voters desire a receipt for voting (to validate time off from work or credit for school), they might think that they had indeed cast their ballot (because the machine said they had), and the printed copy is their receipt.

o   The poll workers were anxious about traffic management to assure that the ballots and cards all came to the scanner. They suggested that a message on screen when the ballot was printed would help. It could instruct voters to take their ballot and activation card to the scanner to cast their ballot.

- The poll workers were uneasy about the comfort level of the older voters with change in the process. They all agreed that having the machines available in public spaces (libraries) prior to the election to allow voters to try them would be important.

- There was some apprehension about the use of compact flash cards to record tallies. These are small, and may be difficult to manage from some workers with limited dexterity.

Candidate Selection

The Dominion software uses two levels of candidate selection, which interact in two different ways from the point of view of the voter.

- **Soft Selection vs Hard Selection.** The first level of selection might be called "soft-selection." When a voter selects a straight party ballot, the candidates from that party are soft-selected and pre-marked throughout the ballot. This will count as a vote unless modified by action of the voter, as discussed in the "implicit" alert area above.

If a voter touches the screen to select a candidate without a straight party choice, this direct action creates a "hard selection." If a soft-selected candidate is touched by the voter, this converts the soft-selection to a hard selection.

- **Cannot leave a straight party contest blank.** Once a voter selects a straight party, the machine will not allow a voter to abstain from any contest. As mentioned in the "Alerts" section, the machine informs the voter that a blank contest will be marked as straight party—even if the voter leaves the names unselected. As one voter discovered on her own, she could effectively abstain from the contest by submitting a blank write-in entry. This is not an appropriate work around.

To the voter, soft-selected and hard-selected votes look the same. This is logically sound, but has unexpected repercussions.

- **Destructive behavior.** If a voter decides that they want to remove a straight party selected candidate in a "Vote for N" contest, they will try to deselect that candidate by touching or selecting that candidate. Instead of deselecting the soft-selected candidate, it converts it to a hard selection. This was not what the voter intended, so naturally the voter touches the selection again. This results in deselecting the candidate, and also deselecting all of the other straight party votes in that contest. This unexpected destructive behavior confused sighted voters.

- **Soft-selection cue.** All of our blind voters, when instructed to vote for an in-party candidate, reselected that candidate, making the selection a hard selection. This suggests that the cue that the candidate had already been soft-selected was not adequate to alert the voter, and might result in unintended cancellation of other in-party candidates.

There were additional candidate selection issues that confused voters.

- **Number of available candidates vs number of selected candidates.** In contests where the voter is allowed to select multiple candidates from the presented roster, there is no indication of the number of candidates available. Nor, after selecting one or more

candidates, is there indication of how many candidates have been selected.

When the roster of candidates is longer than a single screen, or for all blind voters, it is not clear how many candidates are available. This could be remedied by messages that say "Vote for 5 of the 23 candidates" and "You have voted for three of the allowed five votes." When the voter has selected fewer than the allowed number of candidates, they are presented with a warning that they have "undervoted" the contest. It was not clear to our voters what "undervoted" meant, and the language of the warning suggested that this was not a valid vote, and that all five candidates must be selected to be appropriate.

Not all of the issues in this section have clear workarounds or immediate vendor-provided solutions. Counties should have extensive poll worker trainings and many opportunities for voter education to ensure all poll workers and voters know how to successfully cast each vote at the polls.

Reviewing and verifying the ballot

Voters with disabilities will also need voter education on how the ballot review and verification process works for the combination of presentation and interaction mode they are using. This is particularly important because of the use of straight party voting in Pennsylvania

In this voting system, it is possible for a voter to select a straight party option, go directly to the review screen, and then directly to print without any notification from the ballot marking device that they have undervoted any nonpartisan contests or ballot questions.

A blind or low-vision voter who cannot easily verify the printed ballot might never learn that they skipped contests, especially if the precinct ballot scanners are not programmed to report undervotes.

One solution to this would be for the audio at the beginning of the review to announce if there are undervoted contests (and perhaps how many there are).

Recommendations for deployment

The participants – and examiners – saw the systems being tested for the first time during the examination. Many voters will also try using a new system for the first time in the voting booth, so our test was realistic for Pennsylvania voters.

The problems we encountered also suggest ideas for how election officials can support voters and poll workers as they introduce the new system and design their processes and procedures.

The recommendations here are based on observations of how both poll workers and voters used the system and direct suggestions they made.

Advanced training and hands-on practice

The need for an introduction and a chance to try out the system before Election Day was the strongest recommendation from every poll worker participant.

Poll workers felt strongly that any new system – particularly those with digital interfaces – would be intimidating to voters and fellow poll workers who were not used to computers. They recommended:

- Longer training sessions for poll workers to give them more time to familiarize themselves with a new system.
- Opportunities for hands-on experience, including scenarios for different situations they might have to handle.
- An aggressive voter education program to give voters a chance to try out the new system.
- Outreach to voters with disabilities, including those who regularly vote with assistance to let them know about the capabilities of a new system that might help them.
- Have voting machine hands-on demonstrations at disability events so that voters can get to know the machines, practice voting, and be prepared for what they may need on Election Day.

- Instructions or a practice system in the polling place, especially in districts with many older people.

Training for poll workers to support voters with disabilities

Poll workers may not be familiar with how to help people with disabilities. Most of the poll worker participants said that they had no blind or disabled voters in their polling places, although one pointed out that the features on these systems might enable their "assisted voters" to try voting independently.

In addition to a good training module on ways to help voters with disabilities, the training should focus on how to give instructions before and during a voting session to avoid compromising their privacy. For example:

- A "what if" troubleshooting guide could include specific questions to ask and prompts that poll workers can use to help a voter with problem solving without looking at the screen.
- Give poll workers guidance on where to stand while supporting voters. For example, standing behind the ICX and facing the voter would make it clear that they are not looking at the screen.
- Using the procedures for initiating a voting session, including the screens to select a language or acknowledge that assistive technology has been activated, to make sure that the voter has found the basic navigation keys on the keypad. On the ICX, the setting and preferences buttons are at the top of the screen at all times. The poll worker can review these with the voter (reading the instructions to be sure they are consistent and accurate).

Poll worker procedures

Poll worker procedures can also help bridge any information gaps for voters, with instructions embedded in the voting process.

- Tell voters how to insert their ballot: identify that the ballot must be placed in the center of the scan bed, and tell them the ballot is inserted directly into the machine, not just slid forward.

- Remind voters to check both the review screen and their paper ballot before casting.
- Tell voters that if they make a mistake, they can get a new ballot.
- Instruct voters that their ballot can be inserted into the scanner in any orientation. Using the privacy sleeve is the most secure. However, inserting the ballot upside down, with the print toward the floor, is sufficient.

Support for voters using the tactile keypad or dual switch and audio ballot might include:

- A keypad they can try out before entering the voting booth.
- Instructions for how to use the keypad in Braille, audio, and large print.
- Test all assistive aids with local voters.

As a voter approaches the voting station, poll workers can help voters adjust the voting system or attach personal assistive technology:

- Help voters get positioned at the voting system so they can reach all controls. The ICX screen can be adjusted to change its angle for a closer approach, adapting to standing or sitting postures, and avoiding glare.
- Provide help plugging in personal headsets or switches with verbal instructions or by doing it for the voter.
- A voter with a disability is likely to know how to plug in their personal headset or switch, but they will not know the location of the jacks on the machine. On the ICX, the tactile keypad includes two 3.5mm jacks that seems appropriate to insert a headset. One is marked in very small letters that it is for audio. However, the other jack is where the dual switch connects. Counties should ensure poll workers explain the two jacks to voters, at a bare minimum.
- Make sure voters are oriented and know where all parts of the voting system are, including the privacy shields. The ICX includes options to blank the screen during the audio ballot, but then poll workers could bring back the visual mode if the voter has a question.
- Remind voters how to cast their ballot and how to know when they are finished.

Polling place setup

Ensure all polling locations have at least one accessible voting booth with a chair that is easily removed if a voter uses a mobility device.

Voters with disabilities may have assistive technology or personal notes that they need to place within reach. They may also need room to place the printed ballot on a flat surface when using simple personal technology, such as magnifiers or text readers to verify it.

For all voting machines, the path to the touch screen and the scanner should be as easy as possible, ideally a straight line with no obstructions. The path should include ample room to turn a wheelchair if the machine is positioned with the screen facing the wall. The ADA standards suggest a minimum of 60x60 inches for this.

Use assistive technology to support blind and low-vision voters in verifying their ballot, for example, a magnification unit or a simple OCR scanner.

Voting booth setup for this system

Two issues were identified specifically for this system during the examination and usability testing related to how the system and attached devices are placed. The system fits very tightly in the accessible voting booth supplied by the vendor for the exam.

- **Cable management for assistive devices.** The tactile keypad is normally stored behind the screen, connected on a semi-permanent cord. The headphone is plugged in on the right-side front of the tactile keypad. The printer could be set up to the right or left.
  Recommendation: The cords need to be placed so that they don't interfere with the printed ballot or the voter's ability to find and take it.
- **Privacy.** The screen for this system sits close to the front of the booth. It is easy to read the crisp, clear screen display over the shoulder of someone sitting down, or from the side, especially when large text is used.
  Recommendation: Position the booth so the voter's back is to a wall, so no one can walk behind them, and with sufficient space to the left and

All observations

Voter comments and reviewer observations about each machine are described below. For each are, the observations are organized by the machine function then by the severity.

Positives

Function	Observation	System	Severity
General	Blind voter/poll worker - "Once I understand the system, I can whiz!"	ICX	Positive
Display and Navigation	Large, clear, easy to read screen. The screen angle can be changed to three angles: flat, slight incline, and almost vertical.	ICX	Positive
	Default font large enough for most sighted voters.	ICX	Positive
	The system prevents overvotes by greying out the remaining options once the voter has selected the maximum number of candidates in a contest.	ICX	Positive
	Alerts are generally well formatted and in appropriate places. The wording in the alerts is not good, however. (See Problems section below)	ICX	Positive
	The ballot review button is always visible and functional. Voters don't have to review the entire contest or ballot to navigate to the review screen. Likewise, the print ballot button is always available from the review screen.	ICX	Positive
	Large "scroll down/up" buttons at the top and bottom that span the width of the screen.	ICX	Positive
	Straight party vote indicator that allows you to turn on and off straight party votes at any point.	ICX	Positive

Function	Observation	System	Severity
Display and Navigation	Ballot review screen is generally well formatted. Alerts are present in each contest where necessary. In blank or undervoted contests, a "No selection made" label is present for each potential vote for number.	ICX	Positive
Assistive Technology (AT)	Voter - "The disability functions are the best features."	ICX	Positive
	AT includes an audio mode that leaves the screen enabled. The first screen touch reads the selection, and then the same item touched a second time selects it.	ICX	Positive
	If the voter chooses the assistive technology, the touch screen is still active for those who may want to use both.		
	Poll worker commented that these machines would help counties find accessible locations for the machines.		
Write-In Screen	Once a blind voter found the on-screen keyboard, they were able to enter the candidate name quickly.	ICX	Positive
	After completing the write-in, one blind voter said, "That was easy."	ICX	Positive
Printed Ballot & Scanner	While sighted voters (and poll workers) generally did not want to check the printed ballot, blind voters generally did. The use of card stock made the ballot easy to handle. The card reader at the base of the screen created a make-shift easel. Voters could rest the ballot against the machine and use personal AT devices to verify their ballot.	ICX/ICP	Positive
	Seeing AI and other personal AT were able to read the printed ballot to the voters successfully who attempted it.		

Function	Observation	System	Severity
Printed Ballot & Scanner	After the ballot printed, one voter responded "Neat!"	ICX	Positive

Problems

Function	Observation	System	Severity
Setup for Voters	Concern about the power requirements (marker and printer use separate power cords) and confused cables for tactile keypad, speaker, switches, and headphones with power cords. Counties will need to ensure polling locations have enough outlets available, and they will need to think of strategies to contain the cords.	ICX/ICP	Annoyance
	This machine has a lot of additional parts: memory cards, voter cards, access keys.	ICX/ICP	Annoyance
	"Seems like a lot of parts to the process. Our voters will get confused."	ICX/ICP	Annoyance
	Poll workers were concerned if their county did not switch to an electronic poll book, then they would have to have another system to create voter cards on demand.	ICX/ICP	Annoyance
	Poll workers felt that early hands-on exposure to the machines should be provided several weeks before the election, so that voters could become familiar with the process.	ICX/ICP	General comment
Privacy	Because of the large screen size and clear print, some voters were concerned about privacy. It was easy to read the display from several feet away.	ICX/ICP	Annoyance
	When privacy cover is used on ballot, the ballot cannot be inserted to the bottom of the sleeve. The top of the ballot must be outside the sleeve for the scanner to pick it up.	ICX/ICP	Annoyance
Orientation and Navigation	For one contest on the sample ballot, (County Commissioner), the down-contest candidates are not visible on the initial screen. If it were indicated that there were "X Candidates" in total, the voter would be cued to scroll down to find them.	ICX	Problem solving

Function	Observation	System	Severity
Orientation and Navigation	If a voter wants to quickly vote straight party, the system allows selecting straight party, then review, then print. In this process, however, the voter is never presented with the ballot questions. If they do not review their ballot entirely, they receive no warning that any non-partisan contests are blank.	ICX	Problem solving
	As part of the overvote protection, the additional candidates or options are greyed out once the maximum number of selections has been reached. However, this means that the audio does not announce the additional candidate names. This could lead to a voter missing a desired candidate.	ICX	Likely to prevent independent voting for voters with some disabilities
	When using the audio, the straight party button is present in all contests. Every blind voter got stuck on this button and the instructions are unclear as to what the button is or how to navigate away from it.	ICX	Needs Assistance
	No blind voter was able to do the write-in process without some assistance. Most navigated to the box where the name appears, and stopped. No instructions describing the process are available. Once the voter pressed the down or right arrow buttons enough times, they discovered the keyboard, and oriented themselves within the layout.	ICX	Needs Assistance
	It is not obvious that to change your vote, you have to deselect the chosen candidate to bring back the check boxes on the other candidates.	ICX	Problem Solving
Orientation and Navigation	In ballot contests, the keypad navigation wraps from bottom to top, but not from top to bottom. In dialogs, the navigation wraps both ways. This inconsistent behavior can be confusing, and results in inefficient operation.	ICX	Problem Solving

Function	Observation	System	Severity
	On contests that have a number of votes allowed, there must be the same number of write-in opportunities. When navigating by audio, each of these is announced as "Write-in" with no variation in speech. For those depending on this feedback, it is not clear that they are moving through different selections on the ballot. A voter recommended that it say "Write in #1, Write-in #2..." to clarify this.	ICX	Problem Solving
	One voter accidentally selected the ballot "Review" button rather than "Next," after making the first selection in a contest.	ICX	Problem Solving
	There are four ways to insert the card, only one of which works. For a blind voter, the activation card does not have an indication of the correct orientation. (Only the visual display provides instructions). Although all of our blind voters were able to feel the integrated circuit on the card, some instruction is needed on how to insert the card. One voter suggested a small Braille dot on the card as a cue.	ICX	Problem Solving
	At the top of the display at all times there are controls for text size, contrast, and language. For AT users to navigate to these controls, they must press "Select" while the contest title is active, then they can scan through the settings. Used in this way, the select button is inconsistent between selecting choices and navigation, which will be an issue for those with cognitive disabilities. Some blind voters were tripped up by this.	ICX	Problem Solving
Orientation and Navigation	Sighted voter felt that the instruction for the number of available votes (Vote for N) should be larger, and spaced down from the contest title.	ICX	Annoyances
	A sighted poll worker was surprised when the "Next" button changed to "Review." Suggested "End of Ballot" message.	ICX	Annoyances

Function	Observation	System	Severity
	While reviewing the ballot, the voter can jump back to individual contests and make changes. The review ballot button, to return to the review process always returns to the top of the ballot. On long ballots, with voters who make multiple changes, this is an unnecessary burden.	ICX	Annoyances
	If the voter is looking at the second contest on a single screen, making the text larger can cause that contest "disappear." It actually moves to the next page, but that isn't obvious.	ICX	Annoyances
	Poll worker (retired user interface designer) indicated that there should be more space between "Scroll down" and "Print" buttons on the review screen. He accidentally pressed it a few times.	ICX	Annoyances
	The Up/Down and Left/Right buttons on the tactile keypad perform the same navigation. Once voters discovered it, they used only one set of buttons.	ICX	Annoyances
	Several voters and candidates attempted to navigate by swiping, it is not enabled on this system.	ICX	Annoyances
	For voters using the dual switch input, on contests with many candidates, the "Next" button requires many, many button presses. It can cause voters to overshoot their target, and have to do it again.	ICX	Annoyances
	When text is enlarged, text size stays the same in alert messages in a different window.	ICX	Annoyances
Audio Instructions	Ballot header instructions are centered. When instructions are longer than a few words, the justification can chop up sentences strangely.	ICX	Annoyances
	Blind poll worker said "Oh!" In response to the content voice. Then said, "Oh, that's terrible!"	ICX	Problem Solving

Function	Observation	System	Severity
	The voice used for the audio feedback was described by voters as "crappy" and "rinky-dink." Truncates words at high speeds. The word "write-in" was rendered as "ret."	ICX	Problem Solving
	The rate range of the content voice (difference between slowest and fastest rate) was much higher than the instruction voice. When adjusting, the voter can only hear the instruction voice, so may require several tries to get the voice to a desired rate.	ICX	Problem Solving
	The audio instructions are repeated too quickly after pausing on a selection, and they are repeated too often after each navigation.	ICX	Problem Solving
	"The audio instructions are needlessly complicated."	ICX	Problem Solving
	"The [audio] instructions are kind of confusing."	ICX	Problem Solving
	Blind voters indicated that they wanted a verbosity control for the audio instructions. "Give me detailed instructions the first time, then shorter after that, but let me get full instructions again if I need them."	ICX	Problem Solving
	Several voters indicated that they wanted contextual help, not a repeat of the instructions for the tactile keypad when pressing "Help"	ICX	Annoyance
	After going through the instructions for the keypad, the voter asked, "How do I get out of here." It wasn't clear that pressing the "Select" button ended the instructions and moved back into the ballot.	ICX	Problem Solving
Audio Instructions	At the ballot header screen, the audio instructions do not say what to do to enter the contests. Voters repeatedly got stuck.	ICX	Problem Solving

Function	Observation	System	Severity
	The straight party button at the beginning of every contest confused all of the voters. The audio announces it as "Selected straight party candidate republican" and then immediately beings to give instructions on how to select the button.	ICX	Problem Solving
	The straight party button audio instructions are confusing to voters. The visual version is confusing as well. (See more in Alerts section below.)	ICX	Problem Solving
	When you override a straight party vote, the audio still announces the straight party button as "selected straight party" even though none are selected.	ICX	Problem Solving
	One blind voter was confused by the audio instructions. When the machine instructed her to press the "right" button, she interpreted this as the right-hand button, not the right arrow under her left hand.	ICX	Problem Solving
	When the blind voter hit the wrong button on the "Review Screen" button, and moved to the top of the contest, "I doesn't tell me that I didn't go to the review. It takes me back to the top."	ICX	Problem Solving
	All blind users reselect candidates selected by straight party choice. This could suggest that the cue that they are selected is not strong enough.	ICX	Problem Solving
	In the testing process, the voter was instructed to vote for the candidate that was endorsed by both parties. On first pass, this was missed because the pause between "Republican" and "Slash" made it sound as if only one party was involved.	ICX	Needs Assistance
	There are no audio or on-screen instructions for any of the other assistive devices (buttons, sip-and puff).	ICX	Needs Assistance

Function	Observation	System	Severity
Straight Party Voting	Once a voter chooses a straight party option, the system will not let them abstain from a partisan contest. It gives the voter an alert that says that even though the contest is blank, the candidates that match the straight party will be selected. (See more in the Alerts section below.)	ICX	Likely to prevent independent voting for voters with some disabilities
	Overriding a straight party vote deselects the straight party selections. In contests where the Vote for N number is greater than the straight party candidates, voters tried to select additional candidates, but had to reselect straight party candidates.	ICX	Problem Solving
	If you have overridden your straight party vote in any contest, the system will not allow you to cancel your straight party choice without de-selecting the out-of-party votes. All voters who tried to cancel their straight party had to ask how to do it.	ICX	Needs Assistance
	Voters complained that the system seemed to require a straight party vote. They thought it should have instructions indicating that if they do not want to vote straight party, they should select "Next."	ICX	Problem Solving
	Some voters thought that the straight party option selected the party's ballot, as in the primary. Poll workers independently reported the same concern, even they knew the function. Both groups said the instructions were unclear.	ICX	Annoyances
Alerts	The wording of the alerts is not good. Some language was too high level. One message uses the word "implicit."	ICX	Problem Solving

Function	Observation	System	Severity
Alerts	Alert: If left blank, this contest will have implicit choice selections for party [straight party choice] appeared in any contest where a voter made no candidate selection. Most voters and poll workers had no idea what this meant.	ICX	Problem Solving
	One poll worker said "This will get us sued. Voters will say that 'You changed my vote!'" in response to the "implicit" alert in a blank straight party contest.	ICX	Problem Solving
	Most alerts begin with "Warning" which voters and poll workers found too overbearing.	ICX	Problem Solving
	One blind vote indicated "I don't like 'warnings.' I would like to have information about how to proceed or correct an error."	ICX	Problem Solving
	The poll workers did not like "warnings." They preferred information about options to fix them.	ICX	Problem Solving
	When no selection is made in the straight party contest, the system generates a message "Warning, this contest is left blank!" Voters thought they had to make a selection.	ICX	Problem Solving
	The straight party cancel alert language and button labels are overly confusing. This is especially true in the audio instructions.	ICX	Problem Solving
	The straight party audio instructions are too wordy and complicated. It asks the voter to "select 'Confirm' to cancel or 'Cancel' to cancel."	ICX	Problem Solving
	Many voters thought that the undervoted contests warning implied that they were required to vote for the maximum number of candidates.	ICX	Problem Solving

Function	Observation	System	Severity
	On the review screen, a poll worker questioned the location of the message that "Your ballot is valid, but you have warnings." Rather than being located at the top of the screen, she suggested that it be placed between Scroll Down and Print. She said she almost missed it.	ICX	Problem Solving
	On the review screen, a poll worker thought it would be better if the alert icons could be touched for more information and options.	ICX	Problem Solving
Printing/Ballot Verification	After you press "Print" at the bottom of the screen, the alert window warns you that you are about to "Cast" your ballot. This action **does not** cast your ballot.	ICX	Likely to prevent independent voting for voters with some disabilities
	After you print your ballot, the machine displays a message "Thank you for voting! Your ballot is successfully cast." This action **does not** cast your ballot.	ICX	Likely to prevent independent voting for voters with some disabilities
	Poll workers reported that the "your ballot is cast" language will be a problem because voters might leave without putting their ballot in the scanner thinking it is their receipt.	ICX	Needs assistance
	Poll workers thought that the final screen should instruct voters to take their ballot and their voter card to the scanner.	ICX	Likely to prevent independent voting for voters with some disabilities
	The printed ballot reports undervoted contests as "UNDER_VOTE_BY_N" where N is the number of positions still available. The ballot review screen does not do this, which means it is not announced to visually impaired voters using the audio assistance	ICX	Likely to prevent independent voting for voters with some disabilities
	Printed ballot displays no straight party selection as being "Blank contest."	ICX	Problem Solving
	Alerts on printed ballot not informative and confusing. Poll workers thought that voters might think something is wrong since the ballot review screen said something different.	ICX	Problem Solving

Function	Observation	System	Severity
	One voter suggested printing arrows at the top of the ballot to match those on the scanner, indicating the correct alignment. Even when the scanner accepts the ballot in all orientations, this provides a hint that will reduce confusion.	ICX	Annoyances
	One poll worker suggested that the printed ballot should look more like the historical paper ballots.	ICX	Annoyances
Write-In Screen	Using the audio, when a typo is being corrected, the letter just deleted is not announced. This makes it difficult to impossible to know where you are in the process.	ICX	Problem solving
	Using the audio, when deleting characters to correct a misspelling, the audio feedback is "Delete" but does not announce the letter being deleted.	ICX	Likely to prevent independent voting for voters with some disabilities
	When the voter leaves the Write in screen, the audio instructions say "You have written in " and spells the name entered. However, it does not voice the space, so the voter may think that they failed to enter it.	ICX	Likely to prevent independent voting for voters with some disabilities
	"It didn't tell me I had a space. I know I put one in." when writing in a candidate using the audio assistance.		
	No blind voter was able to complete the write-in process without some coaching to continue moving down the write-in page until they found the alphabet. Once they found the alphabet, they were able to proceed quickly.	ICX	Needs Assistance

Function	Observation	System	Severity
	When writing in a candidate using the audio, each letter typed is spoken. If the user pauses, the last audio information is repeated. If the letter is entered again, (for names with double letters), the spoken feedback sounds exactly the same as the repeated feedback from the last entry. There is a high risk of inadvertent doubles or single letters. Repeated feedback and new feedback should sound different.	ICX	Likely to prevent independent voting for voters with some disabilities
	No blind voter was able to complete the write-in process without some coaching to continue moving down the write-in page until they found the alphabet. Once they found the alphabet, they were able to proceed quickly.	ICX	Needs Assistance
Write-In Screen	In standard mode, once you have entered a write-in, you cannot correct it because touching it deselects it. Then when you go back into the write-in screen, it has removed the entry.	ICX	Problem Solving
	The page for write-in candidates doesn't actually provide instructions on how to do the write-in. This is true for standard mode and audio instructions. Audio voters must continue to press down or right to get beyond the text box and editing buttons to find the keyboard.	ICX	Problem Solving
	While using the audio, one blind voter suggested that she might use Help to figure out how to use the Write-In Screen. Help only repeats the instructions for the keypad, and does not provide contextual help as expected.	ICX	Problem Solving
	"It doesn't tell you how to do a write-in, does it? You would never know to press down again."	ICX	Problem Solving
	"OK, I guess I have to go all the way to the end," said one voter when trying to find the write-in screen keyboard in audio mode.	ICX	Problem Solving

Function	Observation	System	Severity
	When navigating the keyboard, the "period" key is announced as "dot." While this makes sense in some applications, names include periods, not dots.	ICX	Annoyances
	Poll Workers: Expected QWERTY layout for on-screen keyboard, but when saw that switch access scanned in order, saw the logic of the layout.	ICX	Annoyances
Assistive Devices	Poll workers felt that the keypad has too many buttons.	ICX	Annoyances
	The "Left/Right" and "Up/Down" buttons do exactly the same thing. Why are they both included?	ICX	Annoyances
Assistive Devices	There is no dedicated button on the tactile keypad to move to the next contest.	ICX	Annoyances
	The help button of the tactile keypad repeats the instructions for how to use the keypad. Blind voters suggested context help on the contests, indicating how to write in a candidate, how to select candidates, etc.	ICX	Annoyances
	The headphone and switch ports on the tactile keypad have no Braille markings, and are very difficult to see for sighted voters.	ICX	Annoyances
	If a voter chooses any assistive device, the touchscreen remains active, but each selection must be touched twice.	ICX	Annoyances
	When used for long ballots, the buttons tend to slide. A person who needs to use the paddle switches may not be able to effectively reposition them. They should be provided with small non-slip pads to hold them in place more strongly.	ICX	Annoyances
	The colors of the button switches (red and blue) were taken to indicate party affiliation. The buttons are provided with green and yellow caps as well, and non-partisan colors should be used.	ICX	Annoyances

Function	Observation	System	Severity
Scanner	The scanner provides no audio feedback to the blind voter.	ICP	Annoyances
	Scanner screen very hard to read at all, impossible from seated position	ICP	Annoyances
	Entry tray for ballots is very small – not long enough to support the entire ballot	ICP	Annoyances
Scanner	Memory cards for poll workers are very small – hard to handle – dexterity problems handling them. But at least not the teeny tiny ones (Compact Flash cards rather than SD cards)	ICP	Annoyances
	"All that [absentee] paperwork after the election [is gone]. Whoopee!" One poll worker said after realizing they could scan absentees instead of tallying them by hand.	ICP	Annoyances

Top positives

The expert examination, voter experiences, and poll worker sessions recognized several positives of these voting systems.

Independent voting

Generally, voters were able to complete their ballot on the ICX and ICP independently, once the facilitator/poll worker provided them with the appropriate accessibility features. No one found the system so difficult or frustrating that they were unable to vote, although several participants identified features that they felt would frustrate less competent voters.

Access features easily learned and helpful

As voters explored the access features, they seemed to learn them relatively easily. Most of the voters use similar assistive devices daily or when they vote.

After a very brief overview of each machine, the facilitator asked poll workers to demonstrate that they understood the function of each access feature by offering the appropriate option to the roll-play voter. Poll workers set up the machines successfully with minimal help – a reasonable outcome for an initial introduction to the system.

All four poll worker groups reported that the access features would help voters who already visit their location on Election Day. They also agreed that these features would likely assist other voters with disabilities that do not currently come to the polls on Election Day.

Default text size

The default text size was large enough for most of the participants. Once the voters discovered the settings button and options, they could easily change the font size. Only one voter required a larger font size to read the screen more easily.

Visual interface clean and intuitive

The examiners observed that the visual interface had aspects that would be intuitive to voters. Some voters echoed this as they experienced the machines, and others demonstrated the good design through use.

- **Selection behaviors.** As voters make selects, the screens behaved as expected for a modern touch interface.

  - **Candidate selection.** Selecting options within each contest was intuitive for voters. Touching the option once put a mark in the box for that candidate. Touching again removed the mark. Straight party votes were cleanly marked in each contest.

  - **Overvoting.** When voters have selected the maximum number of available candidates in a contest, the remaining candidates grey out. In this state, they are visible to the voter, but the voters are unable to select them. This behavior is not mirrored in the audio, though, and is a major problem for audio users. More discussion on this issue can be found in the problems section.

  - **Undervotes.** If voters have not selected the maximum number of allowed candidates in a contest, the candidates remain highlighted and available for selection. Visually, this becomes a noticeable pattern and voters quickly learn in which contests they could select additional candidates.

  - **Straight party.** If the voter selected a straight party option at the beginning of the ballot, the system placed a button just below the contest header and instructions in each partisan contest. This was an intuitive reminder to the voters that they had voted straight party.

- Furthermore, If the voter had selected a straight party option, the system did not grey out the remaining candidate names, but the matching straight party candidates had a check next to them. Voters who understood the straight party method seemed to understand

that they could make changes if necessary, but did not need to make additional selections.

- **Alerts structure.** While marking the ballot, if the voter left a contest blank or undervoted in a contest, for example, the system would alert the voter. The alerts were generally well placed and formatted in a way that makes sense to the voter. Also, if the voter wanted to change a straight party selection, the system alerted the voter in a new differently formatted tile. The same is true right before they printed the ballot.

  All this said, the text in the alerts is small and the wording used in the alerts *was not* good and will be discussed in the problems section below.

- **Review screen.** The review screen was formatted well and generally intuitive. For any contest that was blank or undervoted, the system provided an alert and the label "No selection made" for each of the available candidate spots. This made it easy for voters to recognize how many selections they could make.

Printed ballots verifiable and accessible

The ICX prints the ballot selections on an 8.5 x 11-inch piece of heavy weighted paper. The text is small but could be read by all the sighted voters. They all agreed that this satisfied verification for them.

Voters with low-vision, however would not be able to read the printed ballot without a magnifier or other assistive technology. The print on the ballot was much smaller than the on-screen tex.

Three of the blind voters were able to use a phone-based app that took a picture of the ballot and then read its contents back to them. Each of the voters who used this option were satisfied with this as the verification step.

pennsylvania
DEPARTMENT OF STATE

Voting System Implementation Attestation

System Name: _____

County: _____

Date Installed/Upgraded: _____

The below hardware/software was installed and verified on the system implemented:

System Component	Software or Firmware Version	Hardware Version	Model	Comments (Please specify the implementation details, single device /(desktop/laptop), Client/server/ as applicable
EMS Election Event Designer (EED)	5.5.12.1			
EMS Results Tally and Reporting (RTR)	5.5.12.1			
EMS Application Server	5.5.12.1			
EMS File System Service (FSS)	5.5.12.1			
EMS Audio Studio (AS)	5.5.12.1			
EMS Data Center Manager (DCM)	5.5.12.1			
EMS Election Data Translator (EDT)	5.5.12.1			
ImageCast Voter Activation (ICVA)	5.5.12.1			
EMS Adjudication	5.5.8.1			

EMS Adjudication Service	5.5.8.1			
Smart Card Helper Service	5.5.12.1			
ImageCast Precinct	5.5.3-0002			
ImageCast Central	5.5.3.0002			
ImageCast X	5.5.30			

Further to the key hardware/software components listed above, any of the COTS software and

ancillary components like switches, ballot boxes, charging carts sold on this contract are EAC certified components of the Dominion Democracy Suite 5.5A electronic voting system. (Attach a list of items sold on this contract.)

Dominion has validated that the systems have been installed and hardened following the EAC certified system hardening instructions and no software other than the voting system software has been installed on any of the components.

Vendor Representative Signature: _____

Vendor Representative Name:_____   **Title:**_____

Telephone:_____   **Email:**_____

County Representative Signature: _____

County Representative Name:_____   **Title:**_____

Attachment D – Minimum Training Requirements

Dominion must provide training and training materials as set forth below prior to the first use of the voting system in a primary or general election.

a) A demonstration of and training on the setup and operation of the Voting System to the purchasing county's board of elections' members and staff and the county's precinct election officials.

b) A training session on the Voting System's election management system and/or EPBs for the purchasing county's board of elections' members and no less than two and no more than six staff members chosen by the board of elections. The training sessions must afford the board members and its staff the opportunity to learn how to setup and program an election, and if applicable design and layout ballots independently of the Supplier's assistance and support.

c) A training session on the following subjects for the purchasing county's board of elections' members and no less than two and no more than six staff members chosen by the board of elections:

    i.   programming of all voting units and ancillary devices;

    ii.   tabulating results during the unofficial and official canvass;

    iii.   ensuring accuracy and integrity of results;

    iv.   preparing polling places and setting up the system for election day operation;

    v.   Training on accessibility options of the voting system

    vi.   Election day operating procedures;

    vii.   auditing procedures;

    viii.   conducting a recount;

    ix.   preserving records;

    x.   printing, designing, and formatting election reports;

    xi.   troubleshooting common issues;

    xii.   safeguarding and preventing tampering and unauthorized access to all parts of the Voting System; and

xiii.   Post-election care, maintenance and storage.

d) Any and all system manuals necessary to allow a purchasing county to operate the Voting System independently of the Supplier's assistance and support.

e) Training materials for a purchasing county board of elections to use when training its precinct election officials on how to setup, operate, and close down the Voting System on Election Day.

Attachment E – Source Code Escrow Obligations for Dominion

The Supplier must maintain an escrow agreement covering all source codes of the Voting System and/or EPB for a period of ten years from the date of delivery to and acceptance by a purchasing county board of elections. The Pennsylvania Secretary of the Commonwealth shall have the right to access the source codes in escrow subject to the conditions specified below in subsection (d). The Supplier must pay all costs associated with 1) placing the codes in escrow and 2) verifying that the Supplier has placed the codes in escrow (note: the escrow agent conducts this verification and charges a separate fee for this service).

    a. Source code. Simultaneously with delivery of the Voting System and/or EPB software to purchasing Members, the Supplier shall deliver a true, accurate and complete copy of all source codes relating to the software to an escrow agent.

    b. Escrow. To the extent that Voting System and/or EPB software and/or any perpetually-licensed software include application software or other materials generally licensed by the Supplier, Supplier agrees to place in escrow with an escrow agent copies of the most current version of the source code for the applicable software that is included as a part of the Services, including all updates, improvements, and enhancements thereof from time to time developed by Supplier.

    c. Escrow agreement. An escrow agreement must be executed by the parties, with terms acceptable to the Commonwealth prior to deposit of any source code into escrow.

    d. Obtaining source code. Supplier agrees that upon the occurrence of any event or circumstance which demonstrates with reasonable certainty the inability or unwillingness of Supplier to fulfill its obligations to Commonwealth under this Contract, Commonwealth shall be able to obtain the source code of the then-current source codes related to Voting Systems software, EPB software, and/or any Supplier Property placed in escrow from the escrow agent.

IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF GEORGIA
ATLANTA DIVISION

DONNA CURLING, ET AL., Plaintiffs, v. BRAD RAFFENSPERGER, ET AL., Defendants.	DECLARATION OF J. ALEX HALDERMAN Civil Action No. 1:17-CV-2989-AT

Pursuant to 28 U.S.C. § 1746, J. ALEX HALDERMAN declares under penalty of perjury that the following is true and correct:

1.   I hereby incorporate my previous declarations as if fully stated herein. I have personal knowledge of the facts in this declaration and, if called to testify as a witness, I would testify under oath to these facts.

2.   My July 1, 2021, expert report describes numerous security vulnerabilities in Georgia's Dominion ICX BMDs. These include flaws that would allow attackers to install malicious software on the ICX, either with temporary physical access (such as that of voters in the polling place) or remotely from election management systems. They are not general weaknesses or theoretical problems, but

rather specific flaws in the ICX software, and I am prepared to demonstrate proof-of-concept malware that can exploit them to steal votes cast on ICX devices.

3.   Some of these critical vulnerabilities could be at least partially mitigated through changes to the ICX software if Dominion implemented such changes and jurisdictions deployed them. However, it would likely take months for Dominion to assess the problems, develop responsive software updates, test them, obtain any necessary approvals from the EAC and state-level certification authorities, and distribute the new software to states, as well as additional time for localities to install the changes. But Dominion cannot begin this process, because (to my knowledge) they have yet to learn what is in my report.

4.   My analysis also concludes that the ICX is very likely to contain other, equally critical flaws that are yet to be discovered. Jurisdictions can mitigate this serious risk through procedural changes, such as reserving BMDs for voters who need or request them. Election officials cannot make an informed decision about such urgent policy changes or any other mitigations until they have assessed the technical findings in my report. However, to my knowledge, the Georgia Secretary of State's Office has yet to even request access to it, despite Plaintiffs' repeated offers to make it available to appropriate individuals at the Secretary's Office.

5.   Nor do these problems affect Georgia alone. In 2022, the ICX will be used in parts of 16 states.[1] Nevada will use it as the primary method of in-person voting in certain areas of the state. Louisiana is slated to use it for early voting in a DRE configuration where there is not even a paper trail. It will be used for accessible voting in Alaska and large parts of Arizona, California, Colorado, and Michigan. It will also see some use in parts of Illinois, Kansas, Ohio, Missouri, New Jersey, Pennsylvania, Tennessee, and Washington State. Officials in these jurisdictions too must act to update the software and their procedures, but they cannot do so without information about the problems. Continuing to conceal those problems from those who can—and are authorized to—address them, to the extent possible, serves no one and only hurts voters (and heightens the risk of compromise in future elections).

6.   The most effective way to ensure that the necessary information gets to the parties responsible (without also falling into the wrong hands) would be to share my report with the Cybersecurity and Infrastructure Security Agency (CISA), which operates a Coordinated Vulnerability Disclosure (CVD) program for just this purpose. CISA is a federal agency that collaborates with state and local governments, election officials, federal partners, and vendors to manage risks to U.S. election

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[1] See Verified Voting, "Verifier Search – November 2022," https://verifiedvoting. org/verifier/#mode/search/year/2022/model/ImageCast%20X.

3

infrastructure.[2] Under CISA's CVD process, agency staff would independently validate the vulnerabilities, work with Dominion to develop software updates as necessary, and facilitate sufficient time for affected states and localities to apply mitigation strategies.[3] CISA strives to disclose "accurate, neutral, objective information focused on technical remediation and mitigation" and to "correct misinformation where necessary,"[4] making it well qualified to coordinate the disclosure of such sensitive vulnerabilities.

7.   Geoff Hale, Director of CISA's Election Security Initiative, has confirmed to me that, if the Court permits it, the agency would be willing to receive my expert report and carry out coordinated vulnerability disclosure activities as appropriate (see Exhibit 1). Mr. Hale requests that I and my assistant Drew Springall be available for consultation with CISA during the CVD process, which we would be willing to do subject to the Court's permission.

8.   Informing responsible parties about the ICX's vulnerabilities is becoming more urgent by the day. Foreign or domestic adversaries who are intent on

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[2] Cybersecurity and Infrastructure Security Agency, "Election Infrastructure Initiative," https://www.cisa.gov/election-security.

[3] Cybersecurity and Infrastructure Security Agency, "Coordinated Vulnerability Disclosure Process," https://www.cisa.gov/coordinated-vulnerability-disclosure-process.

[4] *Id.*

attacking elections certainly could have already discovered the same problems I did,

yet Georgia's 2022 primaries are less than nine months away, and other states that

use the ICX will conduct high-profile elections even sooner. It is important to

recognize the possibility that nefarious actors already have discovered the same

problems I detail in my report and are preparing to exploit them in future elections.

Providing my report to CISA through its CVD program will ensure that Dominion

and affected jurisdictions are able to begin appropriate mitigations as soon as

possible. Continuing to withhold my report from CISA puts voters and election

outcomes in numerous states at unnecessary, and avoidable, risk.

9.   I understand that State Defendants object to disclosure to CISA on the

argument that my report should be used only for this lawsuit. But this ignores the

implications of my report and my role in this matter. I am not a party to this lawsuit.

I am an independent expert who was engaged to conduct an impartial assessment of

the security and reliability of the Dominion BMD system, using (in part) election

equipment that the Court ordered I be provided. I have done that, as reflected in my

lengthy, detailed report and other submissions in this matter. As an independent

expert and member of the election integrity community, I have a professional

obligation to take appropriate steps to ensure that the severe vulnerabilities my report

describes are properly remediated, to the extent possible, and that those tasked with

5

election security and administration across the country have the information they
need to make responsible, informed decisions about election procedures, including
the equipment used, the manner and purposes for which it is used (including whether
it is used at all), the steps needed to secure that equipment and other aspects of the
election systems in which it is used, and more. In short, my professional obligations
do not end at the boundaries of this lawsuit, nor do the serious risks to voters and
elections that my report discusses in depth. Additionally, I can imagine no prejudice
to anyone in this lawsuit (or beyond) from disclosure of my report to CISA, nor am I
aware of any claim of prejudice from any of the parties.

10. I of course have complied, and will continue to comply, with all
directives from the Court regarding disclosure of my work in this matter. I submit
this declaration to explain why I believe disclosure of my report to CISA is critically
important (and not just for Georgia) and to respectfully ask that the Court allow that
disclosure, rather than accept State Defendants' position that my findings must not
be shared beyond the confines of this lawsuit, including with those who are
authorized to address the vulnerabilities with the ICX and stand ready to do so. If my
findings regarding the ICX actually present no meaningful risks to voters and election
outcomes and therefore require no remediation, as I gather State Defendants would
have the Court believe, CISA is well positioned to determine that. If, on the other

hand, my findings do warrant remediation, as I believe they do, then CISA is well

positioned to work with Dominion and the appropriate authorities around the country

to implement remedial measures. I can see no reason to prevent (or further delay) that

important work for future elections. And I note that none of State Defendants' experts

have disputed my findings regarding the ICX machines. Only Dr. Juan Gilbert has

responded to my sealed report, and he has not examined the machines (or used them)

to my knowledge.

I declare under penalty of the perjury laws of the State of Georgia and the

United States that the foregoing is true and correct and that this declaration was

executed this 21st day of September, 2021 in Ann Arbor, Michigan.

_____
J. ALEX HALDERMAN

9/2/2021 Vulnerability Disclosure

Case 1:22-cv-01639-SHR   Document 1-2   Filed 10/18/22   Page 190 of 294
Case 1:17-cv-02989-AT   Document 1771-1   Filed 09/21/21   Page 10 of 11
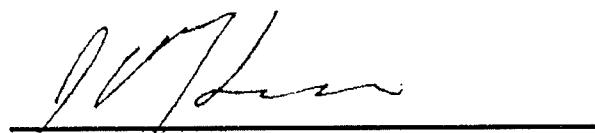
◢◤ Gmail

J. Alex Halderman <halderman@gmail.com>

Vulnerability Disclosure

Hale, Geoffrey <Geoffrey.Hale@cisa.dhs.gov>
To: "J. Alex Halderman" <jhalderm@umich.edu>
Cc: Andrew Springall <andrew.springall@gmail.com>

Thu, Aug 19, 2021 at 12:15 PM

Prof. Halderman,

Thank you for your email. Yes, CISA would be willing to receive the report regarding possible vulnerabilities in election infra tructure for inclu ion in CISA' Coordinated Vulnerability Di clo ure (CVD) proce   and would carry out any further coordinated disclosures activities as appropriate. As we share on our public website (https://www.cisa.gov/coordinated-vulnerability-disclosure-process), CISA's CVD program coordinates the remediation and public disclosure of newly identified cybersecurity vulnerabilities in products and services with the affected vendor(s). Note that part of our process may al o involve validating any alleged vulnerabilitie , planned mitigation , remediation , or patche with the ecurity researcher who discovered the alleged vulnerability, so we would appreciate if you could continue to be available for consultation during the CVD process as well.

As shared on our website, please submit any vulnerability reports for CVD coordination using the form here: https://www.kb.cert.org/vuls/report/

Best,

Geoff

From: J. Alex Halderman <jhalderm@umich.edu>
Sent: Wednesday, August 18, 2021 4:37 PM
To: Hale, Geoffrey <Geoffrey.Hale@cisa.dhs.gov>
Cc Andrew Springall andrew pringall@gmail com
Subject: Vulnerability Disclosure

:CAUTION: This email originated from outside of DHS. DO NOT click links or open attachments unless you recognize :
and/or trust the sender. Contact your component SOC with questions or concerns.

Dear Mr. Hale,

We are writing to you in your capacity as Director of the Election Security Initiative at the federal Cybersecurity and Infra tructure Security Agency (CISA)

We under tand that the Election Security Initiative at CISA work to en ure the phy ical ecurity and cyber ecurity of the systems and assets that support the Nation's elections, including through detection and prevention, information sharing and awareness, and incident response.

9/2/2021

Case 1:22-cv-01639-SHR Document 1-2 Filed 10/18/22 Page 191 of 294
Case 1:17-cv-02989-AT Document 1177-1 Filed 09/21/21 Page 11 of 11

As you may be aware from recent press reports, one of us (Halderman) is presently serving as an expert witness for the plaintiffs in Curling v. Raffensperger (Civil action no. 1:17-CV-2989-AT, N.D. Ga.), a case that concerns the security of Georgia' election y tem A year ago, the court granted plaintiff acce to an ICP ballot canner and IC ballot marking device as used in Georgia in order to test their security. Following months of analysis, on July 1, Dr. Halderman submitted an expert report that describes several very serious vulnerabilities we found in the equipment, which, to our knowledge, have not been previously documented or disclosed.

Given the nature of the vulnerabilities and the time that would be necessary to mitigate them before the 2022 midterm election , we believe it i critical for Dominion and affected juri diction (which include Georgia and part of many other states) to begin taking responsive action soon. It is also vitally important to prevent information sufficient to exploit the vulnerabilities from falling into the wrong hands, and to avoid fueling election-related misinformation if possible.

Currently, disclosure of the expert report to anyone other than outside litigation counsel for the parties is strictly prohibited by the Court' protective order and by recent directive from the judge However, if permitted by the Court, we would like to share the report with CISA and ask your agency to carry out appropriate further disclosure of the information it contains to Dominion and affected jurisdictions as you see fit, under CISA's coordinated vulnerability disclosure (CVD) program (https://www.cisa.gov/coordinated-vulnerability-disclosure-process).

We under tand that under thi proce , CISA will work with the vendor (Dominion) for mitigation development and the issuance of patches or updates and to facilitate sufficient time for affected end users to obtain, test, and apply mitigation strategies. We further understand that CISA strives to disclose "accurate, neutral, objective information focused on technical remediation and mitigation" and to "correct misinformation where necessary".

Plea e confirm that CISA would be an appropriate agency to handle coordinated vulnerability di clo ure for election infrastructure under these circumstances, and that you would be willing to receive the report (subject to the Court's permission) and carry out further disclosures as you deem appropriate.

Sincerely,

J. Alex Halderman

Drew Springall

Fulton County Pennsylvania Election System Analysis
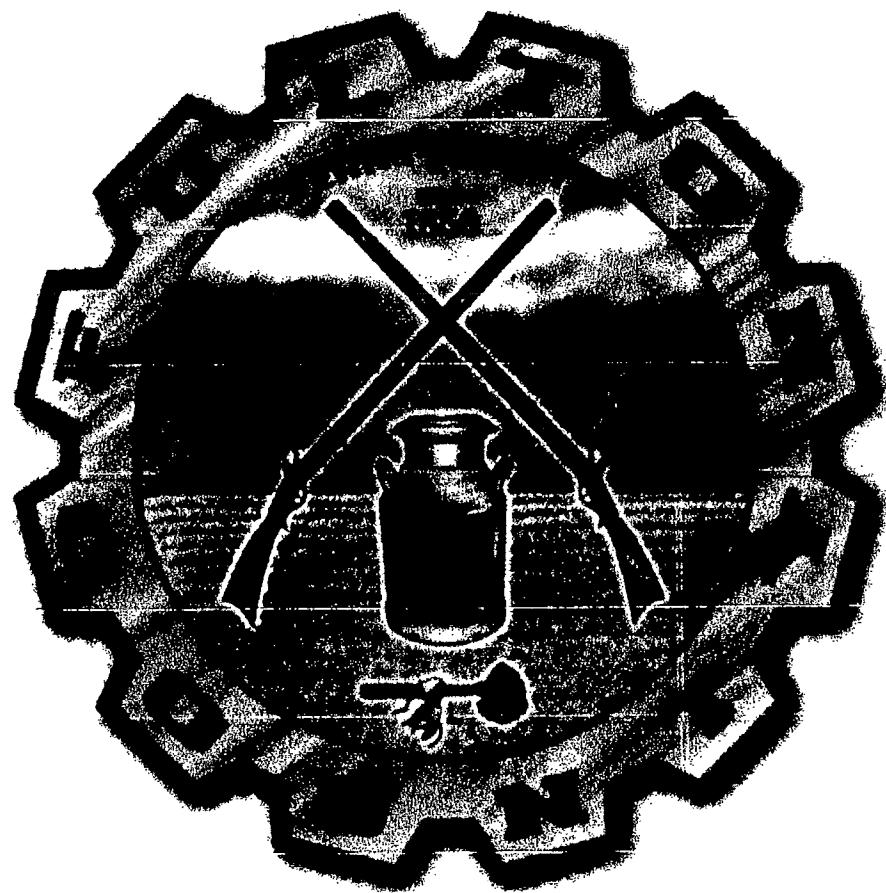
By WAKE Technology Services, Inc.

February 19, 2021

Fulton County Pennsylvania
Election Assessment

WAKETSI

Table of Contents

Fulton County Pennsylvania
Election Assessment

Fulton County Pennsylvania
Election Assessment

Fulton County Pennsylvania
Election Assessment

WAKETSI

1 Executive Summary

The purpose of this assessment was to ascertain how the election was conducted, initially from a mail-in, and then from an absentee ballot perspective. With the assistance of the Election Commissioners and the Election Director, this assessment resulted in a full election process and system review. WAKE TSI did not conduct a forensic technology audit of the election management system as WAKE TSI did not have the agreement of the stakeholders to conduct that level of detailed analysis.

Since this was a voluntary assessment, WAKE TSI accepted what was provided and were flexible when the Election Officials did not want to provide sensitive information, such as chain-of-custody documentation that identified County personnel and security tag log files, that identified current numbering schemas. Nor did WAKE TSI look at the configuration of the EMS itself or how the election was designed or built.

<u>What the issues highlighted in this document reveal, is that the election was well run, was conducted in a diligent and effective manner and followed the directions of the Commonwealth. This does not indicate that there were no issues with the election, just that they were not the fault of the County Election Commission or the County Election Director.</u>

Fulton County had no anomalous or unusual incidents reported during the election process. Expectations were that this assessment would not show any indications of error, technology interference, fraud, or misconduct. Five issues of note were found in the conduct of the election, three of which are related to the EMS Vendor:

1. There were a number of errors in ballot scanning
2. The failure of Dominion Voting to meet the Commonwealth Certification requirements
3. The addition of non-certified database tools installed on the system.
4. Changes were made to the EMS three (3) weeks prior to the election
5. The lack of Commonwealth L&A inspections of the voting systems.

The last issue is hard to understand as the Commonwealth's documentation requires the DOS to collect the L&A testing results.

While these may seem minor the impact on an election can be huge. The adjudication process of the Dominion system is caused by the scanning system and software not being able to read the intent of the voter. This forces human intervention and for those humans to "determine" the intent of the voter.

2 Fulton County Demographics

Fulton County, Pennsylvania is located in south central Pennsylvania. The County Seat is in McConnellsburg. The assessment was completed at the County Offices located at 116 West Market Street, McConnellsburg, Pennsylvania 17233.

Fulton County Pennsylvania
Election Assessment

WAKE TSI
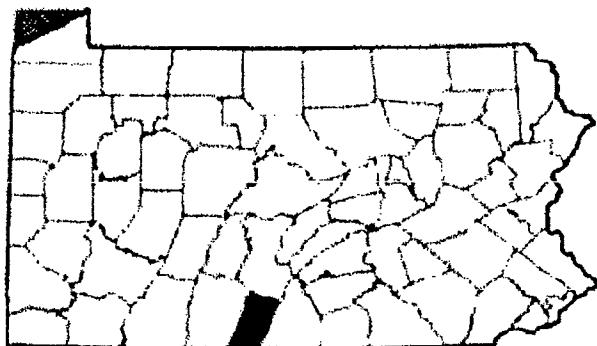
Image 1 – Fulton County Location

2.1   County Description

Fulton is a small county of approximately 14,619 people with approximately 9,847 registered voters. The County averages 33.38 people per square mile, 26.53 people of voting age per square mile and 22.48 registered voters per square mile. These numbers mean little until you begin to compare them to larger more densely populated areas.

County Population	Voting Age Population	Registered Voters	Votes Cast	County Land Area	Registered Voters Per Sq Mile
14,619	11,622*	9,847	8,019	438 sq miles	22.48
	79.50%	84.73%	81.44%		

Table 1 – Fulton County Demographics
*Estimated from 2019 Census Department numbers

The voting age population (VAP) is estimated to be 11,622 people, which, is approximately 79.50% of the County population. Of the Voting Age population approximately 84.73% of these people are registered voters and of those 81.44% voted in the 2020 General Election.

2.2   Voting History and Registration Roles

During the 2020 Presidential General Election Fulton County had 8,019 votes cast at 13 polling locations with 81.44% of registered voters casting a ballot. This is a high percentage of voters even for a Presidential election but was quite common in this election cycle across the Commonwealth and the nation.

The assessment reviewed all 954 mail-in ballots, all processes followed for In-Person, Mail-In, Absentee, Provisional voting and the handling of adjudicated ballots. WAKE TSI also reviewed voting related information published by the County, posted on the County web site, reported by news media and reported by the office of Commonwealth of Pennsylvania Department of State (DOS).

Election history in the Pennsylvania SURE system, for Fulton County, goes back to elections beginning in 1987.

Fulton County Pennsylvania
Election Assessment

Of the 9,847 Registered Voters 1,468 (14.81%) people did not vote in the 2020 General Election. Fifty-six (56) people who voted in the Primary did not vote in the General Election. The Commonwealth's voting records show that Fulton County has 702 people whose date of last vote was unknown or was prior to 1987. There are 1,065 registered voters who have not voted in an election between 1987 and the 2019 elections. This accounts for 10.82% of the County's registered voters.

Somehow the explanation of the voting numbers in the previous two paragraphs do not add up to 100% of the registered voters. Fulton County has 9,847 registered voters, there were 8,019 votes cast (81.44%) and 1,468 (14.81%) registered voters who did not vote. This totals 1,828 voters. Missing is an explanation of what happened to 360 voters (3.66%)?

What this information suggests is that the Voter Registration rolls need to be validated and purged if possible. From the data that was purchased from the Commonwealth we were unable to determine which field indicates inactive voters.

2.3   County Election Commission

The County has a mostly rural population, which has voted overwhelmingly Republican for elections since 1964.

The County has 13 voting precincts based upon the Townships and Boroughs within the County.

Image 2 – Fulton County Poling Precincts

The county Election Commission consists of three members: Stuart L. Ulsh (R), Chair, Randy H. Bunch (R) and Paula J. Shives (D). All three are business owners in the County.

There is also an Election Director who manages the elections, maintains voting equipment and voting integrity, oversees data security, is responsible for ballot security and reports the tallies to the Commission and the Commonwealth. The Election Director is assisted in many functions by the Fiscal Administrator and the County Information Technology Consultant. The Election Director and the Fiscal Administrator are County Employees.

The County's Information Technology support is provided by a contracted firm. The primary support person is an employee of that firm who has been doing the technology work for the County for many years.

3   Company Performing Review

WAKE Technology Services Inc. (WAKE TSI) is a managed services provider specializing in data center, network, server and desktop systems design, cybersecurity and management, as well as remote help desk and systems support. The company develops and executes various processes and methodologies across all its disciplines. The firm was founded in 2004 and has worked with organizations in Healthcare, Government, Manufacturing, Insurance, Automotive, Higher Education and Professional Services industries.

WAKE TSI's technical and management teams are experienced in working with DOD and other federal agencies as well as state and local governments. This includes working with the Commonwealth of Pennsylvania's State System of Higher Education (PASSHE).

WAKE TSI is located in West Chester, Pennsylvania.

3.1   Who Wrote / Compiled the Report

This report was compiled and written by E. Eugene Kern, Executive Vice President of WAKE TSI. Mr. Kern has been working in the information technology field since 1982. His background is in technology infrastructure (not programming). His experience includes network, systems, data center, physical design, systems and cybersecurity management as well as extensive project management experience. He has been at the management and executive levels in the information technology field for more than 30 years both as a consultant and as a member of various organizations.

Mr. Kern is a co-founder of WAKE TSI and has been the Executive Vice President since the firm began.

3.2   Team Performing Assessment

WAKE TSI's Team consisted of three (3) ballot counters, two (2) technical personnel and one (1) management person acting as program director / observer.

Our cybersecurity team who collected, reviewed and analyzed the technology data has experience with DOD/DARPA, NSA and other federal agencies.

For further company information please see our website at https://www.waketsi.com.

4   WAKE TSI Process Followed

Two visits were made to the County Offices. The first on December 31, 2020 and the second on February 9, 2021. For both visits to the Election Offices, our Personnel provided government issued identification and signed a log at the request of the Election Director, prior to being allowed to visit the election system area. WAKE TSI also agreed that our inquires and work would not change or impact any of the systems reviewed. The County agreed to keep the names of our personnel private so that none of them could be threatened or harassed, as Mr. Kern has been after the first visit and subsequent newspaper reports were circulated.

Fulton County Pennsylvania
Election Assessment

For our first visit, WAKE TSI provided a sign-in log for collection of contact information and to understand who the stakeholders were. This is also to ensure we know who the proper people are for follow-up questions and requests. Since the second visit was with the entire Election Commission and the Election Director, WAKE TSI did not ask for a sign-in log to be completed.

4.1   Assessment Scope

The assessment was intended to review the mail-in ballots for each County and validate that all conduct relating to the mail-in ballot requests, distribution, receipt and counting were in line with Federal and Commonwealth guidelines. WAKE TSI was not asked, nor did we conduct, a technology forensic audit of either the operating system or the EMS. WAKE TSI did review operating and application system file dates, operating system and application log files, ballot images and related files.

WAKE TSI personnel did not "image" the EMS systems. WAKE TSI did receive copies of various ballot image directories and log files for offline evaluation. WAKE TSI was careful to not infringe upon any portion of the Dominion software agreement with the Commonwealth or with the County.

The ballot images that WAKE TSI received, do not allow for the identification of individual voters. WAKE TSI did not inspect, review, assess or copy the County Electronic Poll Book or any of the mail-in or absentee ballot envelopes.

4.2   First Visit

During the first visit our technology team collected electronic copies of EMS application log files, directory information, TIF images of the scanned ballots, Operating System (OS) directory and file information, OS log files and pictures of the paper Mail-In ballots.

This technology-oriented data collection was utilized to compare manual log files to electronic files to ensure that the conduct of the election from a manual process matched the technology-oriented process.

The Election Director, or an Election Commissioner, remained in the room with the ballots throughout the entire course of our review. The Election Director was the only person removing and replacing ballots in the ballot carts. Ballots were placed on the counting table for review and then immediately placed back into the ballot cart once the review was complete.

The IT Support Technician, or an Election Commissioner, remained with the technical team during the assessment of the voting systems and was the only person to access, copy or download information from the EMS, as he does as a regular part of his duties. WAKE TSI personnel were escorted at all times while we were in all of the election system related areas during the assessment.

4.3   Second Visit

The second visit to Fulton County occurred on February 9, 2021. WAKE TSI returned to ask follow-up questions about processes, review some of the sensitive documentation that the

Fulton County Pennsylvania
Election Assessment

WAKETSI

County did not want to have copied and to discuss the absentee ballots and the County's adjudication process.

4.4   Overall Process

This was a voluntary assessment by the County, WAKE TSI accepted what was provided and understood when Election Officials declined to provide sensitive information, such as chain-of-custody documentation that identified County personnel and security tag log files, that identified current numbering schemas. WAKE TSI was allowed to view, but not copy, this type of documentation on the second visit.

The Election Commission did provide the templates utilized for these and other requested documentation and the processes used by County Personnel for securing the ballots and transporting them from the Precinct voting locations to the Central Tabulation Point (McConnellsburg County Office). WAKE TSI also discussed but did not review County provided training materials used for the General Election. Some of this documentation is in the process of being updated by the Election Director as 2020 was the Election Director's first year in the position and has identified processes that needed refinement and updating to help Poll Workers better understood and follow the election process in Fulton County.

4.5   Collection of Data

As stated previously, WAKE TSI's technology people were assisted by the County's Information Technology Consultant. WAKE TSI was allowed to receive copied files from the application directory of the EMS Server, the tabulation machines, the EMS workstation and the adjudication workstation. WAKE TSI also obtained lists of all operating system files on each of the machines. WAKE TSI received copied configuration files, images and log files from all of the machines, both from the OS and the EMS.

4.6   Forensic Technology Tools Utilized

Since this was voluntary assessment and not an audit, WAKE TSI did not collect information (disk images) from the machines as we would in a "normal" forensic audit. For this reason, WAKE TSI did not utilize any of our forensic tools for the assessment.

5   Conduct of Election

The County Election Commissioners agreed, on a two to one vote following party lines, to have this voluntary audit conducted and provided technical and administrative oversight and support for the effort. Later the Election Commissioners again voted to allow WAKE TSI to count and discuss the Absentee Ballots. Our request and the vote were what prompted the second trip to the McConnellsburg. Fulton County is in two State Senate Districts as the maps below show.

Fulton County Pennsylvania
## Election Assessment

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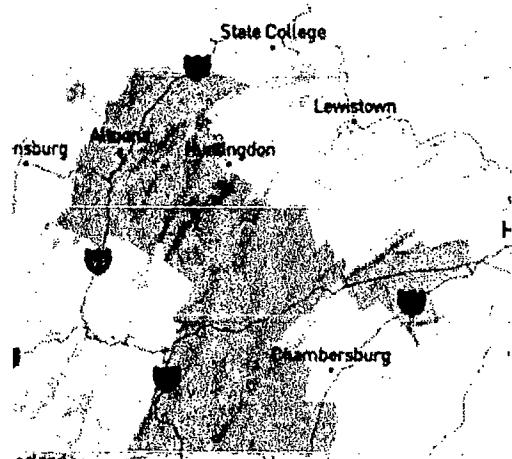
Image 3a – PA Senate District 30 – Image from Pennsylvania Senate web site
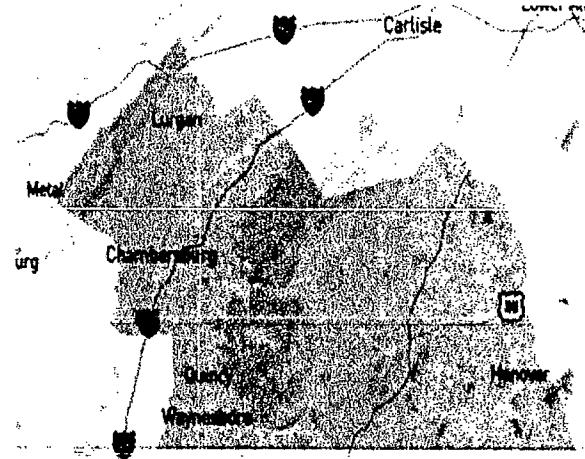

Image 3b – PA Senate District 33 – Image from Pennsylvania Senate web site

Since the County is in two State Election Districts both State Senator Judy Ward and State Senator Douglas Mastriano were aware of our efforts.

5.1 Anomalies

Election anomalies occur in many forms and vary from election to election depending on how the election was conducted and who ran the election. Anomalies can be human errors, equipment failures, configuration errors, software failures, paper issues and such mundane items as water leaks and power failures.

5.1.1 Election Process Anomalies

There were no reported conduct anomalies during this election. The Judge of Elections, at each polling location, and the Minority and Majority Inspectors (Observers from both major parties) were at each polling location during In-Person voting and then escorted the ballots from the *precincts to the County Offices for tabulation.*

Multiple County Election Officials were present at all ballot handling, tabulation, adjudication and reporting functions. At no time was only one-person handling ballots without supervision by other election officials. No accounts of conduct irregularities were reported during the election cycle either before, during or after the election in Fulton County.

5.1.2 Voting System Anomalies

There were no EMS system anomalies reported during the election or in the election results reporting.

WAKE TSI found two EMS anomalies with the voting system which were; 1) the number of scanning errors and 2) the installation of the Microsoft SQL Server Data Tools (SSDT).

For the first issue the Federal Government has set an allowable error rate of 1 error in 250,000 ballots scanned for an allowable error rate of 0.0004%. Fulton County should not have had any ballot scanning errors according to Federal guidelines.

Fulton County Pennsylvania
Election Assessment

There were two sets of log files reviewed for this assessment. The first is the error log files on the ICC machines (scanning tabulation machines). These log files show that scanning issues occurred during system setup / testing on 10/18/2020, during the election process on 11/3/2020, during the County validation on 11/6/2020, and during the certification process on 11/10/2020. Usually, the scanning issues were one error during a batch of fifty ballots being scanned. This leads to an error rate of 0.02% during batch processing. If you look at the approximately 40 scanning errors that occurred during the election process this provides an error rate of approximately 0.005%.

The second set of log files from the EMS server show that during the 11/03/2020 General Election there 3,383 individual events, of which 142 were for scanning errors (4.20%) and only three (3) were for write-in ballot warnings (0.09%). The scanning errors are far in excess of the allowable error rates as legislated by the Federal Government.

WAKE TSI suggests that this issue should be resolved by the EMS Vendor.

5.1.3   Other Anomalies

The only other anomaly reported was with the printing of ballots in one of the precincts. The ballots are printed with a tear off tag that shows the voter what number voter they were for that election and day. The printing firm, who provided the ballots, mistakenly started the ballot numbers at the wrong number, which forced a change in the tracking of the ballots provided to that location.

This issue had no impact on the actual voting in the Precinct.

5.2   Public Communications

The Web Page is the primary form of communications for the County during election periods. Individual Candidates, or Parties, provide all their own election materials. The County does not provide election advertising except for signage for polling locations and ballot collection points that indicate locations and processes to be followed.

5.3   Web Page

The County website shows election results since 2002 and is consistent with what other online sources provide. This information was also confirmed via data from the Pennsylvania Statewide Uniform Registry of Electors (SURE) system.

Fulton County has an easy-to-use website with all voting information (information, reporting and registration) accessible from a link on the left side of the County Homepage. The website was built and is maintained by the County's contracted Information Technology Services Company.

The election page displays the primary access points in the middle of the page as boxes. Above the boxes is an election day phone number for assistance or issue reporting. Sample ballots for all precincts are easily accessed from this page.

Fulton County Pennsylvania
Election Assessment

5.3.1 Sample Ballots

The sample ballots are downloadable as PDF files and match the County precincts, mail-in ballots and election day ballots. The Sample ballots have a watermark showing them as "Specimens". This watermark was easily removed with Adobe Acrobat. The sample ballots print the same size as the election day ballots (8.5 by 11.0 inches). The sample ballots do not contain any Precinct identification or serial numbers.

See Sample Ballots in Appendix A — Sample Ballots.

5.4 EMS System Physical Security (Machines, Ballots and Devices)

The voting systems are maintained in multiple rooms in the basement level of the County Office building listed above. The rooms are only utilized by the Election Commission and are kept locked unless personnel are utilizing the rooms as part of their duties.

The building has a keycard security system and reporting of access to the various areas can be generated as needed. The building also houses Veteran Affairs and Domestic Relations offices. They are separate with their own entrance and security system. Personnel from these Departments do not have access to the Election Systems areas.

All ballot carts, paperwork carts, supplies, and EMS related devices are stored in the election area of the building. Some election related paperwork is kept in the Election Director's office, which is on a different floor in a secured access area.

There is one ballot cart and one paperwork cart per precinct. All carts were locked and sealed with numbered security tags, which were removed by the Election Director as the mail-in ballot count proceeded.


Image 4 – Ballot Carts
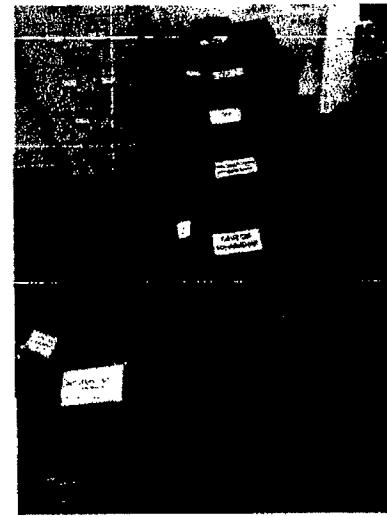
Image 5 - Paperwork Carts

Note in the pictures above the red security tags on the Ballot Carts and the green security tags on the Paperwork Boxes.

Fulton County Pennsylvania
Election Assessment

WAKETSI

Once the ballot recount had been completed for a Polling location, the ballots were immediately replaced by the Election Director and resealed.

The Election Director maintains a log of the security tags when removing / replacing the security tags. The log is kept on her County provided computer located in her office and is only accessible by her.

See a template of the log file in Appendix D – Security Tag Tracking Template.

5.5   Poll Book

The Poll Book is not part of the Dominion Election Management System. While the two are related and work together, the Poll Book is not generated by, nor used by, the Dominion System directly. Individual counties throughout the Commonwealth use a variety of electronic or manual Poll Books.

Fulton County uses a "Manual Poll Book" printed from data in the State Voter Registration Database. The Poll Book is printed the Friday before the election and delivered with the Ballots and other Paperwork to the Judge of Elections at each Precinct in preparation for Election Day. The Poll Book is updated from Friday through Election Day as registration information is updated or new voter registrations are added to the statewide Voter Registration database.

The Poll Book is signed by each voter and the Poll Workers hand a ballot to the Voter. While ballots were not serialized, the pre-printed in-person ballots do have a tear-off tag intended to inform Voters what number voter they were for that precinct.

The process followed by the Poll Worker distributing ballots is to inform the person managing the Poll Book the number of the ballot tag, which is then entered into the Poll Book, with that person's name. Once that ballot is cast the numbered tag is removed and provided to the Voter.

Since these ballot tag numbers are written into the Poll Book, they become part of the voting record. A curious side effect of the tear-off ballot numbers being entered into the Poll Book is that it allows for tracking of individual voting by comparing the Poll Book to the batches run through the tabulation machines. Since the ballots are carefully tracked in batches and are placed in the ballot carts in the order voted it allows for this matching of voting order to the Poll Book and to the images taken for the counting process.

In January 2021, after WAKE TSI had collected data from Fulton County, the ex-Secretary of the Commonwealth, Kathy Bookvar requested that Fulton County perform a random sampling analysis of voting in the County. The State personnel who performed the analysis selected a not-so-random sample of Ballots from a comparison of the Poll Book to the batch logs to select the ballots they wanted to review for sampling. The results showed that rather than the actual 85% percentage voted for President Trump the selected sampling showed an 89% voting selection. We do not know why the vote review / sampling was conducted in this manner. This information was provided to WAKE TSI by one of the Election Commissioners.

Fulton County Pennsylvania
Election Assessment

WAKE TSI

5.6   Ballot Casting and Election Results

Fulton County certified that they only counted votes cast / received by 8:00 pm on November 3, 2020 or as appropriate for absentee ballots in accordance with state and federal guidelines. All ballots are cast in the precincts and taken to the McConnellsburg County Offices for tabulation and reporting. There is a McConnellsburg Precinct location as well where voting occurred.

The Election Director utilized a handwritten Ballot Scanning Log for managing the batches during scanning. The log sequentially tracked batches by polling location, quantity in the ballot cart and type of ballot. The Election Director's handwritten log files exactly matches the scanning logs from the tabulation devices labeled ICC#1 and ICC#2 as to the ballot type, size and number of ballots per batch ran through the devices. Most of the batches run through the system were in groups of 50 ballots. The largest batch was 108 ballots, and the smallest batch was 1 ballot.

Ballot abbreviations on the log include Mail-In = MI, Election Day = ED, and PR = Provisional. These designations match the directory structure of the ballot images within the EMS directory structure. Absentee ballots were included in the mail-in category for logging purposes but were tracked separately in the ballot carts and in the EMS. Provisional ballots were handled by the Election Director under the supervision of the Election Commissioners.

See Appendix B – Ballot Scanning Log Example

The County Sheriff's Department is present at the McConnellsburg Offices, on election day, to observe that there are no interruptions or interference with proper procedures. They do not take part in the transportation of ballots or voting equipment.

The ballots are transported from the Precincts to the election offices in McConnellsburg by the Election Judges and the Minority and Majority Inspectors. Chain-of-Custody documents, for the ballots and supplies were utilized by the County for transport.

WAKE TSI did request and receive copies of the templates used for these documents as shown in Appendix C - Ballot Tally & Tracking Template and Appendix D - Security Tag Tracking Template

The following table shows the votes cast and reported by election for the 2020 General Election on the County web site and through the Pennsylvania SURE system:

Election Race	Total Vote Count
Presidential	7,961
Attorney General	7,815
Auditor General	7,762
State Treasurer	7,761
Representative in Congress	7,840
Representative in the General Assembly	7,261
Count of People Voting as Reported in SURE	8,019

Fulton County Pennsylvania
Election Assessment

WAKETSI

Table 2 – Votes by Election Contest

All votes were scanned / tabulated using devices labeled ICC#1 and ICC#2. All mail-in ballots were scanned using ICC#2 while ICC#1 served in a backup roll.

5.6.1   Election Night Versus Certified Results

The table below shows the differences between the reported numbers.

Date	County Population	Registered Voters	Total Votes Cast	Biden	Trump	Third Party	Write In	Total Votes For President
Nov 3	14,619	9,847	7,807	1,068	6,660	79	0	7,807
Nov 20	14,619	9,847	7,981	1,085	6,824	69	3	7,981
Diff	0	0	174	17	164	(10)	3	

Table 3 – Election Night Reporting vs Certified Reporting

As the table above indicates, election night reporting did not match with the certified results. The reasons provided for this difference were receipt of military and civilian absentee ballots, clarification of write-in ballots, resolution of provisional ballots and adjudication of ambiguous ballots. The table above shows the differences between the election night and certified results and what ballots changed categories.

The log files show that ICC#1 had two provisional ballots scanned on 10/13/2020 as part of the setup of the election. None were scanned on this device during the 11/3/2020 election.

The log files on ICC#2 had 22 provisional ballots scanned on 10/13/2020 in two batches as part of the election setup. Twelve (12) provisional ballots were scanned on 11/06/2020 in six batches as part of the ballot adjudication process, and 115 ballots were scanned on 11/10/2020, in two batches, as part of the certification process.

See the County Certification Report in Appendix E – County General Certificate of Results

5.6.2   In- Person Ballots

The printed In-Person ballots do have a machine-readable ID (barcode) in the lower left corner that identifies the precinct in which the ballot was cast. The example below is from an image of an Ayr Township ballot. Image 1 is from the top center of the ballot and Image 2 is from the lower left corner of the ballot. All Ayr Township Ballots have the same marking. The markings for each Precinct are distinct and match from ballot to ballot within the precinct. This is the only difference between the sample ballots and the actual ballots used in the election.

This difference stops someone from downloading the sample ballots, printing them and then casting them as if they were actual ballots. The barcode does not identify individual voters.

**Fulton County Pennsylvania
Election Assessment**

WAKE TSI

OFFICIAL MAIL-IN BALLOT
FULTON COUNTY, PENNSYLVANIA
GENERAL ELECTION, NOVEMBER 3, 2020
AYR TOWNSHIP

Image 6 – Top of Ballot
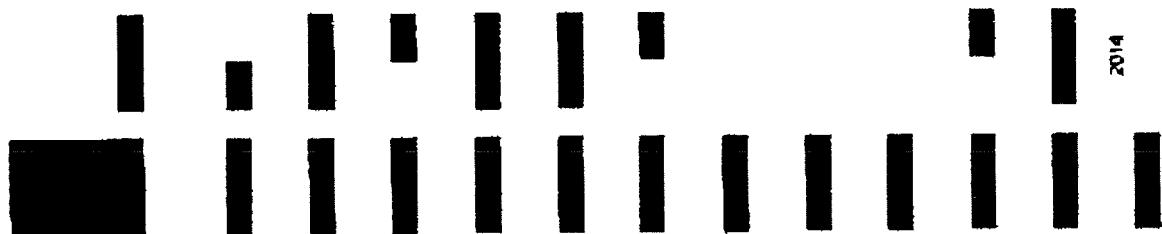
Image 7 – Bottom of Ballot

The ballots are also printed on a heavier stock than the normal 20-pound paper used by copiers and for other technology uses. The reasoning behind this was explained as assisting the scanners in feeding individual ballots without as many jams.

5.6.3 Provisional Ballots

The following table is the count of Provisional Ballots listed by the reason for inclusion in the provisional category.

Township	Total # Provisional Ballots Received	Not Registered	Absentee / MI Not Returned	Registered But Not in Poll Book	Excepted Ballots
AYR	10	3	6	1	7
BELFAST	11	0	11	0	11
BETHEL	18	2	13	3	16
BRUSH	18	4	12	2	14
DUBLIN	10	0	10	0	10
LICKING CREEK	9	0	9	0	9
MCCONNELLSBURG	8	1	5	2	7
TAYLOR	7	0	7	0	7
THOMPSON	21	4	16	2	18
TODD	10	3	6	1	7
UNION	15	3	12	0	12
VALLEY HI	0	0	0	0	0

Fulton County Pennsylvania
Election Assessment

WAKE TSI

WELLS	11	3	8	0		8
SUBTOTALS			115	11	-	126
TOTALS						

Table 4 – Provisional Ballots

As can be seen by the table above 23 voters who were not properly registered, plus 115 people who had requested an absentee or mail-in ballot which had not been returned and 11 people who had registered but were not in the Poll Book. These 149 ballots were not counted in the election for these failures in following the proper process to vote.

5.6.4   Mail-In Ballots

The numbers below represent the numbers of the Mail-In ballots requested and returned to the County. The numbers below are from the Pennsylvania SURE system. Of this amount 954 Mail-In Ballots were completed properly and counted for the election.

Requested	All Returned	Returned By 11/3	Returned After 11/3	Not Returned
	86.28%	99.11%	0.89%	13.72%

Table 5 – Mail-In Ballot Numbers

In accordance with Department of State directives only Mail-In ballots delivered by 8:00 PM on November 3, 2020 were counted. The McConnellsburg Post Office worked diligently with the Election Commission to deliver Mail-In ballots twice-a-day during the last few days leading to deadlines. Sometimes calling the Election Director to inform her that there was no mail for that day.

5.6.5   Absentee Ballots

Absentee ballots are handled differently from mail-in ballots as they have different rules, regulations and deadlines. Absentee ballots were counted if they were postmarked by November 3, 2020 and received prior to November 6, 2020.

An Absentee ballot request is a different type of request from a Mail-In ballot request.

5.7   Results Reporting

WAKE TSI reviewed several sources to ensure that reporting was consistent and accurate. The results were then compared to information which was provided from the EMS. The reporting reviewed was completed from Election Night Results through Result Certification and included published results from November 3 through December 28.

5.7.1   County Web Site

All the information on ballot count reporting above is from either the County's web site or the Pennsylvania SURE system.

Fulton County Pennsylvania
Election Assessment

All information reported by the SURE system is input by the Election Support Team of Fulton County. The data is transported from the EMS to the County Election Director's workstation via thumb drive and then uploaded to the SURE system.

The County web site is easy to use and has reports in standard formats that do not need adjustment to run reporting or statistical tools against.

See the County election web site at this link: https://www.co.fulton.pa.us/elections.php

5.7.2   Media

WAKE TSI reviewed reporting by the New York Times (NYT) for all counties in Pennsylvania as well as reporting provided by local and national television and cable outlets. WAKE TSI also reviewed results posted on or by national voter data tracking outlets like Edison Research, Scytl and Verified Voting.

This data was compared to the information provided by the County and the Commonwealth's web sites.

5.7.3   Commonwealth

As the table at the beginning of this section indicates the highest count of votes appeared in the Presidential race, with 7,981 ballots cast. This table is based upon the certified election results from November 10th. The State SURE system indicates that 8,019 ballots were cast in the County. There is a difference of 38 votes (0.47% of ballots cast). This difference is from the remediation of issues such as double voting where only one candidate can be selected, but two were marked, naked ballots (mail-in ballots) where the security envelope was not included in the outer envelope when the ballot was returned, write-in ballots for famous entities like Mickey Mouse, Jesus Christ, Abraham Lincoln, etc. and ballots cast by people who were not properly registered.

5.7.4   EMS Vendor Website

No reporting of election results was found at the Dominion web site as some of the other Election Management System Vendors provide.

6   Election Management System (EMS)

Fulton County uses the Dominion Democracy Suite 5.5A as certified by the Pennsylvania Secretary of State (SOS). The County began using the Dominion EMS in 2019. It has been used in the last three (3) elections. More information on the EMS and how to use it can be found at the Department of States web site listed here: https://www.votespa.com/Voting-in-PA/Pages/Voting-System-Demos.aspx.

The EMS system was originally installed and used for the 2019 Municipal Election and was utilized for the 2020 Primary and 2020 General Elections. The EMS Server log files indicate that the election management system was originally installed on 08/16/2019 and updated for the Municipal Election on 10/17/2019. The next date that the system logs show the EMS as being updated is for the 2020 General Election (10/13/2020). The election files from all three

Fulton County Pennsylvania
Election Assessment

elections were on the server. This information matched exactly what the Election Commission provided.

6.1   EMS Software Components

The Dominion Democracy Suite 5.5A consists of the following software and firmware components:

Application	Version
EMS Election Event Designer (EED)	5.5.12.1
EMS Results Tally and Reporting (RTR)	5.5.12.1
EMS Application Server	5.5.12.1
EMS File System Service (FSS)	5.5.12.1
EMS Audio Studio (AS)	5.5.12.1
EMS Data Center Manger (DCM)	5.5.12.1
EMS Election Data Translator (EDT)	5.5.12.1
ImageCast Voter Activation (ICVA)	5.5.12.1
EMS Adjudication	5.5.8.1
EMS Adjudication Service	5.5.8.1
Smart Card Helper Service	5.5.12.1
ImageCast Precinct (ICP)	5.5.3-0002
ImageCast Central (ICC)	5.5.3-002
ImageCast X (ICX)	5.5.10.30

Additional Commercial Off The Shelf (COTS) software and firmware included in the systems has been defined as part of the EAC system certification scope. We did not include this information as it is listed in the Commonwealth certification document, which has been included as an Appendix.

6.1.1   Third Party Software Components

All expected third party software components were installed in the system. Versions were as listed in the certification documentation.

File dates and times matched the expected results and file sizes matched software vendor data for the versions installed.

6.2   EMS Devices Utilized

Fulton County Pennsylvania uses the Dominion Democracy Suite 5.5A EMS. The following is an excerpt from the Pennsylvania Certification Report for the Democracy Suite 5.5A components considered for use in Pennsylvania.

> "The System is intended to provide a paper-based voting system with end-to-end election support, from defining an election to generating final reports. The system is comprised of both precinct and central count tabulators, and BMDs as the ADA component. The system components include: The Election Management System (EMS), the ImageCast Central (ICC) - utilizing two

Fulton County Pennsylvania
Election Assessment

Commercial Off the Shelf (COTS) scanners, the ImageCast Precinct (ICP) optical scanner and the ImageCast X (ICX) (Prime and Classic) ballot marking devices."

6.2.1   Ballot Marking Devices

The County provides Ballot Marking Devices (BMD) in each Polling Location as required by HAVA and Commonwealth guidelines. These devices can be used by anyone who wishes to use them instead of a paper ballot. The voter views the ballot on the computer screen, makes their selections and then a ballot is printed with their selections listed and with a QR code that is read by the tabulation machine when these ballots are scanned.

The important point here is that the machine readable QR code is what is being scanned and entered by the tabulation machine not the human readable details printed on the ballot.

We are not inferring anything by making this point, we are just stating the obvious, that what you see and what the machine reads is not the same information when using these devices. That does not mean that the QR code is any different than what is printed on the ballot, just that you cannot see what it says.

See an example of a printed BMD generated ballot in Appendix F - BMD Ballot Printout.

The certified ballot marking device that the County uses is the ImageCast® X (ICX) Ballot Marking Device (BMD). This is a ballot marking device with a Commercial Off The Shelf (COTS) printer, HP LaserJet Pro Printer M402dn or HP LaserJet Pro Printer M402dne, for printing marked ballots.

Once the BMD generated ballot is printed it is then added to the Precinct Ballot Cart for transportation to the Central Tabulation Site in McConnellsburg, as are the hand marked ballots.

The BMD printed ballot is scanned into the system using the same tabulation devices as the hand marked ballots.

WAKE TSI did not review any of the BMD devices during this assessment.

6.2.2   Tabulation Machines

Fulton County does not utilize a tabulator at the precinct voting locations. All scanning and tabulation functions are completed at the central McConnellsburg location.

Fulton County utilizes the ImageCast Central Station (ICC), a ballot scanning and tabulating system that can be configured with high-speed COTS scanners, Canon Image Formula DR-G1130 or the Canon Image Formula DR-M160- II, to tabulate ballots in the central office.

Fulton County has labeled their devices ICC#1 and ICC#2. All reporting refers to these names and it is included in the log files from the server and tabulation machines.

6.3   EMS Training

At this time the Election Commission and County Staff have received a portion of the required training. The situation with training is that at the time of system purchase the then Election

Fulton County Pennsylvania
Election Assessment

Director was retiring, and the current Election Director was not yet onboard. The Election Commission decided to postpone some of the training until the new Election Director was onboard.

Dominion "owes" the County training manuals, training and system manuals. The Election Commission expects that Dominion will provide those materials and training prior to the 2021 Municipal Primary which occurs May 18, 2021.

See the section below on Commonwealth training requirements for more details.

6.3.1   Election Commission

The Election Commissioners and the Election Director received some training from the EMS Vendor, Dominion. It is intended to familiarize the Commissioners and Election Director with the election process, conduct and security.

It is provided as part of the purchased contract for the system.

6.3.2   County Workers

This group includes the Election Director, IT support and others as needed. This training is also provided by the Vendor and is part of the system purchase contract. Dominion's contract with the County provides for training for up to six (6) of the Counties personnel. More can be purchased as needed.

The training is provided as online videos, manuals and printed guides as well as in-person training as needed.

6.3.3   Poll Workers

The training for Poll Workers is mostly provided by the County, with assistance from Dominion. This training is based on Dominion materials but is modified to meet the needs of the County. Locality specific training is created and designed by the Election Director. It also includes instructional materials from the Vendor for the use of the Ballot Marking Devices in the Precincts.

6.3.4   Information Technology

The Vendor has not yet provided training materials or manuals for information technology support of the system.

The Vendor is scheduled to provide that information in 2021, prior to the May election.

6.3.5   Commonwealth Requirements for Training

Commonwealth law and County contracts require that Dominion must provide training and training materials as set forth below prior to the first use of the voting system in a primary or general election.

   a)   A demonstration of, and training on, the setup and operation of the Voting System to the purchasing county's board of elections' members and staff and the county's precinct election officials.

Fulton County Pennsylvania
Election Assessment

WAKE TSI

b) A training session on the Voting System's election management system and/or EPBs for the purchasing county's board of elections' members and no less than two and no more than six staff members chosen by the board of elections. *The training sessions must afford the board members and its staff the opportunity to learn how to setup and program an election, and if applicable design and layout ballots independently of the Supplier's assistance and support.* (Emphasis added by WAKE TSI)

c) A training session on the following subjects for the purchasing county's board of elections' members and no less than two and no more than six staff members chosen by the board of elections:

   a. programming of all voting units and ancillary devices;
   b. tabulating results during the unofficial and official canvass;
   c. ensuring accuracy and integrity of results;
   d. preparing polling places and setting up the system for election day operation;
   e. Training on accessibility options of the voting system
   f. Election day operating procedures;
   g. auditing procedures;
   h. conducting a recount;
   i. preserving records;
   j. printing, designing, and formatting election reports;
   k. troubleshooting common issues;
   l. safeguarding and preventing tampering and unauthorized access to all parts of the Voting System; and
   m. xiii. Post-election care, maintenance and storage.

d) Any and all system manuals necessary to allow a purchasing county to operate the Voting System independently of the Supplier's assistance and support.

e) Training materials for a purchasing county board of elections to use when training its precinct election officials on how to setup, operate, and close down the Voting System on Election Day.

Dominion did not meet the training requirements for the reasons stated above and has continued to build the election system for the County for each of the elections since the system was installed.

6.4   EMS Last updated

The EMS was last updated on 10/13/2020. This update consisted of Dominion delivering the 2020 General Election Build to the County. No documentation of what this update consisted of was provided at the time of the upgrade.

As it turns out this was the actual election build and not an update to the EMS software and occurs three (3) weeks prior to the election. This update occurs at this point as it is after candidate's final withdrawal date occurs.

The issue here is that the County does not receive a formal document that states what changes were made during the update.

Fulton County Pennsylvania
Election Assessment

WAKETSI

6.5   Error handling in the Election Management System

The allowable election error rate established by the Federal Election Commission guidelines is 1 in 250,000 ballots (.0004%). We observed 40 errors in the scanning log files for an error rate of 0.4988%.

6.5.1   Classification of Ballots

The Dominion Systems classify ballots into two categories, 1) normal ballots and 2) adjudicated ballots. Ballots sent to adjudication are from occurrence of an error during scanning such that the technology cannot determine the intent of the voter.

Ballots sent to adjudication must be altered by election administrators and adjudication files can be moved between different Results Tally and Reporting (RTR) terminals with no audit trail of which administrator actually adjudicates (i.e. votes) the ballot batch.

The lack of audit trail shows a serious flaw in the security and election integrity because the system does not provide a meaningful technology method for observation of the adjudication process or audit trail of which administrator actually adjudicated the ballots.

Fulton County has one (1) adjudication Results Tally and Reporting terminal. It is referred to as the Adjudication Workstation by County Employees and Contractors.

6.6   EMS Handling of Errors (Adjudication)

Fulton County's adjudication process consists of review of ballots that were not machine readable. The process is observed by three people. The County Solicitor provided that direction to the Election Director. The Commonwealth guidelines indicate that a minimum of two people must observe the adjudication process.

There were two sets of ballots that were adjudicated during the election. The first set were adjudicated by the Election Director and two other county employees on 11/06/2020. The second set was adjudicated by the Election Director in the presence of the Election Commission on 11/10/2020 during the election certification process.

The issues that resulted in adjudication were cases involving people voting for multiple candidates, write-in ballots and unclear markings.

The Dominion EMS does not provide a clear way to determine the number of adjudicated ballots, or their outcome, from log file reviews. While WAKE TSI can tell how many ballots were rejected by the electronic scanning system, which would indicate a need for adjudication, we cannot track what the final outcome of those ballots were. Outcomes could include; candidate selection, over or under vote conditions or ballot rejection.

The County did manually track and provide that information.

6.7   EMS System Configuration

WAKE TSI did not closely investigate the systems settings within the EMS System. If this had been a forensic analysis or some anomalies had been reported that level of effort would have

**Fulton County Pennsylvania
Election Assessment**

WAKE.TSI

been suggested. In this case our preliminary analysis did not indicate that level of investigation was required.

In all cases that where we reviewed the EMS settings and operating parameters, the County IT Support Technician keyed in all information and took us through the screens and settings of the system.

6.8   Review of EMS System Logs

WAKE TSI did review system logs from the EMS system. These are the logfiles that show configuration events (changes, errors, etc) as detected by the EMS itself. These were reviewed and showed the changes and scanning errors as would be expected.

These files are not encrypted and can be accessed via a text editing tool.

6.9   Configuration files

WAKE TSI did review the EMS configuration files. These were reviewed to validate that the system changes that the County informed us had occurred were indeed what the system had logged as well. All log files matched expected events and changes.

6.10 EMS Backups

The County IT Support person conducted EMS backups at regular times. All of the backups were conducted when changes were to be made to the systems and when reporting was being conducted.

There were EMS backups from all election periods and during all election system definitions. The county IT person also backed up the EMS prior to our arrival to ensure that we had no impact on the system configuration or data.

7   Computer Hardware

On the Server machine all data files are retained for all elections the system is utilized for.

The tabulation machines, EMS workstation and adjudication workstation contain the current, 2020 General Election, data. <u>On these machines the previous election files are overwritten when the next election's preparations are installed.</u>

All systems were Dell OptiPlex workstations running Microsoft Windows 10 workstation. These workstations are listed as part of the system components on the PA DOS website and in the certification reports for the system.

The ICC workstations had Cannon scanners attached as suggested in the Commonwealth's certification documents.

7.1   Disk Drives

None of the internal disk drives for any of the systems were encrypted. This would allow a malicious actor to remove the disk drive from the system and read the files on an external system, if they were able to gain physical access to the system.

Fulton County Pennsylvania
Election Assessment

WAKETSI
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8   Computer Operating System (OS)

The Dominion Election Management System application runs on the Microsoft Windows Operating System (OS). The Fulton County machines had version 10 of the operating system installed.

As a security best practice the OS should be reduced to remove extraneous applications that are not needed for the operation of the voting system. This includes applications like MS Office stubs / Get Office, Calendar, Mail, News, Microsoft Solitaire Collection, Games, Xbox, Store, 3D Builder, Alarms and Clock, Calculator, Camera, Contact Support, Cortana, Skype, Get Started, Groove Music, Maps, MS Edge, Money, Movies & TV, OneNote, Phone Companion, People, Photos, Sports, Voice Recorder, Weather and any extra OEM hardware applications.

The Fulton County systems did not have these applications removed. The Democracy Suite was "certified" by the State of Pennsylvania with these applications and as such had to be installed with these extraneous applications.

8.1   Other Required Microsoft and Third-Party Products

The certification report list fifty-two (52) Microsoft and other third-party products required to run the election management system. All of the listed products had been installed as of the date of our examination.

Since this was not a technology forensic examination of the system, we did not go into the details of whether they were changed since installation or whether they were the correct versions as listed in the certification report.

The one major area of concern with installed software is that Dominion has installed the Microsoft SQL Server Data Tools (SSDT) on the server. This software is not part of the EAC certified configuration and makes the system certification invalid.

There is no valid reason for Microsoft SQL Server Data Tools (SSDT) to be installed on the EMS. *This software toolbox allows any user with access to change and manipulate the EMS databases without logging (recording) to the Database, EMS or OS logfiles.*

Dominion has installed this toolbox on all installations of their software that we have inspected.

8.2   Patches

The operating systems (OS) were checked to ensure that modules were up to date on security patches and fixes, to review the date that the patches were installed, and to ensure that no malware was present on the machines used by the voting system.

Patches were **NOT** up to date; they had been installed over a year before the election. The reason for this is because the Election Management System Certification Process does not allow any changes to the EMS once it has been certified without complete recertification and that includes changes to the operating system. This makes the Operating System vulnerable to cyber-attack if it is attached to the Internet.

Fulton County Pennsylvania
Election Assessment

There are multiple ways that the Windows Workstation Operating System can be updated. The first is a direct connection to Microsoft via the Windows Update Manager in settings, which requires an Internet connection. The second approach is through Windows Server Update Services (WSUS). The third approach is via System Center Configuration Manager SCCM. The fourth approach is through a manual process of going to the Microsoft Windows website and downloading the patch manually. Error logs and file dates show that none of these approaches were used on any of the operating systems that the EMS resides on.

8.3   MS Defender Anti-Virus

The Microsoft Defender Antivirus is included with the Windows 10 OS. This application was not configured on any of the five devices that make up the EMS. None of the five machines had current antivirus patches.

8.4   OS Log Files

All expected OS log files were present on all five devices running Microsoft Windows 10. They all had entries from installation through our inspection and none showed any evidence of tampering.

The operating system log files on the devices showed that they had never been connected to the Internet or to any external network.

9   Extraneous (Non-EMS, Non-OS) Applications

For all computers used for a specific purpose, security best practices dictate that the machines are used solely for that single application. In this case the EMS. No other applications should be installed on the device unless it is required for the explicit use of the voting system.

The Fulton County systems did not have any external (non-OS or Election) applications installed that were not utilized by the Election Management System, other than the extraneous Microsoft software that comes with version 10 of the OS and the SQL toolbox files discussed previously.

**Fulton County Pennsylvania
Election Assessment**

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10 Applicable Federal and State Laws

WAKE TSI is not a law firm, nor are we legislators, however the seeming discrepancies between the laws laid down by the Federal Government, the Commonwealth of Pennsylvania and what is done by the EMS vendor does not seem to be in synch.

So far we have discussed discrepancies in training, provisioning of Logic and Accuracy documentation, extraneous software tools and attestation when system components are changed or replaced.

The following is intended to provide the background about why we think these are issues that need to be addressed by the Commonwealth and the Vendor.

10.1 Federal Statutes (HAVA)

The Help America Vote Act of 2002, or HAVA, is a United States federal law which passed and was signed into law by President Bush on October 29, 2002.

The goals of HAVA are:

1. replace punch card and lever-based voting systems;
2. create the Election Assistance Commission to assist in the administration of federal elections; and
3. establish minimum election administration standards.

HAVA mandates that all states and localities upgrade many aspects of their election procedures, including their voting machines, registration processes and poll worker training. The specifics of implementation have been left up to each state, which allows for varying interpretations of the federal law.

10.1.1 State Funding, Planning & Reporting for HAVA

A description of the HAVA law on WIKIPEDIA describes the application approach to be taken for States to apply for HAVA funding. We have quoted WIKIPEDIA below:

> "To be eligible for federal funding, states must submit a plan describing how payments will be used and distributed, provisions for voter education and poll worker training, how to adopt voting system guidelines, performance measures to determine success (including goals, timetables, responsibilities, and criteria), administrative complaint procedures, and the committee who helped develop the state plan.
>
> Each year the state receives federal funding they must submit a report to the Election Assistance Commission (EAC) detailing a list of expenditures, the number of and types of voting equipment obtained with the funds, and an analysis and description of the activities funded."

HAVA rules have changed many election functions from being local community responsibilities to Statewide requirements. These include: Voter Registration codified in the 1993 National Voter Registration Act (NVRA), Voter identification requirements, provisional ballot creation and the HAVA law created the Election Assistance Commission (EAC).

Fulton County Pennsylvania
Election Assessment

WAKETSI

HAVA also provides funds for making polling places accessible to individuals with disabilities. This includes the purchase of Ballot Marking Devices and the conversion of older buildings to become ADA compliant.

10.2 State Statutes

WAKE TSI is discussing the statutes below since it would appear that discrepancies exist between Pennsylvania Department of State (DOS) conduct and Federal and Commonwealth Laws.

10.2.1 Ballot Secrecy

"The Pennsylvania Constitution mandates secrecy of the vote. Consequently, Mail-in ballots are separated from their outer envelopes before being counted so that no one can determine how the mail-in ballot voter votes. Pa. Const. art. VII, § 4." This was a statement made by the DOS in a letter to Representative Seth Grove.

This is why in the Poll Book Section we questioned why the Department of State (DOS) representatives looked through the Poll Book and then selected ballots for a "random" ballot count. No one is supposed to know who voted for which candidates, but it would seem that the DOS is aware of how constituents voted through the matching of ballot scanning order to the Poll Book and numbered tags on the ballots.

10.2.2 HAVA discrepancy

The Commonwealth's schedule of elections for 2021 is shown below. There is a disclaimer with this document that any of the dates are subject to change without notice. The purpose in showing this schedule is to indicate that the setup of the election files within the individual elections are not considered to be changes to the election system itself. If the election setup was included, then the Commonwealth would not be in compliance with HAVA 90-day rules for no changes allowed to the EMS prior to an election.

Date	Scheduled Activity	Days to Election
16-Feb	First day to circulate and file nomination petitions	91
17-Feb	HAVA 90-day cutoff for changes to EMS	90
9-Mar	Last day to circulate and file nomination petitions	70
10-Mar	First day to circulate and file nomination papers	69
16-Mar	Last day to file objections to nomination petitions	63
24-Mar	Last Day for withdrawal by candidates who filed nomination petitions	55
20-APR	**Approximate Date of Election Setup to be expected by County	28
3-May	Last day to REGISTER before the primary	15
11-May	Last day to apply for a mail-in or civilian absentee ballot	7
18-May	*Last day for County Board of Elections to receive voted mail-in and civilian absentee ballots (must be received by 8:00 PM)*	0

Fulton County Pennsylvania
Election Assessment

WAKE TSI

18-May	Municipal Primary Election	
19-May	First day to REGISTER after primary	167
25-May	Last Day for County Board of Elections to receive voted Military and overseas absentee ballots (submitted for delivery no later than 11:59 PM on May 17)	161
2-Aug	Last day to circulate and file nomination papers	92
4-Aug	HAVA 90-day cutoff for changes to EMS	90
9-Aug	Last day to file objections to nomination papers	85
9-Aug	Last Day for withdrawal by candidates nominated by nomination papers	85
9-Aug	Last day for withdrawal by candidates nominated at the primary	85
5-Oct	**Approximate Date of Election Setup to be expected by County	28
18-Oct	Last day to REGISTER before the November election	15
26-Oct	Last day to apply for a mail-in or civilian absentee ballot	7
2-Nov	Last day for County Board of Elections to receive voted mail-in and civilian absentee ballots (must be received by 8:00 PM)	0
2-Nov	Municipal Election	
3-Nov	First day to REGISTER after November election	
9-Nov	Last Day for County Board of Elections to receive voted Military and overseas absentee ballots (submitted for delivery no later than 11:59 PM on November 1)	

Table 5 - **These dates are estimates based upon previous election installations as shown by log files on the systems. They ranged from 3 to 4 weeks before the election in all three cases.

10.2.3 Commonwealth Election Data Retention

The list of statutes below provides the retention timeframes for election data. This list is from the DOS website at the following link:
https://www.dos.pa.gov/VotingElections/Documents/Elections%20Division/Administration/Election%20statutory%20reference%20guide.pdf

The DOS does not provide direct access (links) to any of the statutes from their website. We were unable to find a complete retention list from any Pennsylvania Department web site.

Data Area for Retention	Statutes	Months
Absentee ballot records	25 P.S. § 3146.9	22
County election records (generally)	25 P.S. § 2649	22
Copies of district records retained by minority inspector	25 P.S. § 3060(f)	
Federal election records retention	42 U.S.C. § 1974	22
Preservation of nomination petitions, certificates and papers	25 P.S. § 2943	
Preservation of campaign finance reports	25 P.S. § 3259(4)	
Record of ballots	25 P.S. § 3071	
Voter Registration Records (generally)	25 Pa.C.S. § 1405; 4 Pa. Code § 183.12	24
Voter Registration Records (cancelled voters)	25 Pa.C.S. § 1904(a)	

The DOS does not provide direct access (links) to any of the statutes from their website. We were unable to find a complete retention list from any Pennsylvania Department web site via a

Fulton County Pennsylvania
Election Assessment

WAKETSI

DUCK-DUCK-GO web search or from a Google Search. Nor did we find the election statutes from any DOS or pavotes.gov website search. We did finally locate all record retention timeframes for elections in the County Records Manual. This is a PDF document issued by the County Records Committee by the Pennsylvania Historical and Museum Commission Bureau of the State Archives Harrisburg. This is the organization assigned the responsibility for retaining all State records.

Please see Appendix H – Pennsylvania Election Record Retention Rules for a complete list of all election records to be retained, timeframes for retention and the supporting statute that orders the retention.

10.3 Pennsylvania Certified EMS

> "Article XI-A of the Pennsylvania Election Code, 25 P.S §§ 3031.1 et seq., authorizes the use of electronic voting systems. Section 1105-A of the Election Code, 25 P.S. § 3031.5, requires that the Secretary of the Commonwealth (Secretary) examine all electronic voting systems used in any election in Pennsylvania and that the Secretary make and file a report stating whether, in his opinion, the electronic voting system can be safely used by voters and meets all the applicable requirements of the Pennsylvania Election Code."

The above quote is the opening paragraph from each certification report signed by the Pennsylvania Secretary of State, or Acting Secretary of State, as was the case in January 2019 when the Election Management System used in Fulton County was certified by the Commonwealth of Pennsylvania.

The Dominion Democracy Suite 5.5A was certified by the State of Pennsylvania Acting Secretary of State Kathy Boockvar on January 17, 2019.

> "Upon the request of Dominion Voting Systems Inc. (Dominion), the Department of State's Bureau of Commissions, Elections and Legislation (Department) scheduled an examination for October 15, 2018 of the Democracy Suite 5.5 voting system. The voting system presented for certification in Pennsylvania included the Democracy Suite Election Management System (EMS) election management software used in conjunction with the following components: 1) ImageCast® X (ICX) Ballot Marking Device (BMD), a ballot marking device with Commercial Off The Shelf (COTS) printer, HP LaserJet Pro Printer M402dn/HP LaserJet Pro Printer M402dne, for printing marked ballots; 2) ImageCast Precinct Scanner (ICP), a precinct optical scan ballot tabulator that scans, validates and tabulates hand-marked paper ballots and ballots produced on the BMD; and 3) ImageCast Central Station (ICC), a ballot scanning and tabulating system that can be configured with high speed COTS scanners Canon Image Formula DR-G1130 /Canon Image Formula DR-M160- II to tabulate ballots in central office.
>
> The Acting Secretary appointed SLI Global Solutions (SLI) and the Center for Civic Design (CCD) as professional consultants to conduct the examination of Democracy Suite 5.5."

Fulton County Pennsylvania
Election Assessment

WAKETSI
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Information above is quoted from the Pennsylvania certification report of the Dominion Democracy 5.5A Suite.

Please see the entire certification report for the Dominion Democracy Suite 5.5A system at the DOS website:
https://www.dos.pa.gov/VotingElections/Documents/Voting%20Systems/Dominion%20Democracy%20Suite%205.5-A/Dominion%20Democracy%20Suite%20Final%20Report%20scanned%20with%20signature%20011819.pdf

11 Election System Certifications

The EMS has to be certified first by the Federal government and then by the State government prior to a County being able to buy the system. This true for all States and Counties participating in the **voluntary** EMS certification program in the United States.

11.1 Election Assistance Commission (EAC) Certification

The Election Assistance Commission was created by the Help America Vote Act (HAVA) and is a voluntary program which 40 states participate in. The current guidelines are Voluntary Voting System Guidelines Version 1.0 (VVSG 1.0), published in
All information provided in this section is from the EAC website. We left all links active so that anyone may easily follow up in areas of interest.

> The U.S. Election Assistance Commission (EAC) was established by the Help America Vote Act of 2002 (HAVA). EAC is an independent, bipartisan commission charged with developing guidance to meet HAVA requirements, adopting voluntary voting system guidelines, and serving as a national clearinghouse of information on election administration. EAC also accredits testing laboratories and certifies voting systems, as well as audits the use of HAVA funds.
>
> *Other responsibilities include maintaining the national mail voter registration form* developed in accordance with the National Voter Registration Act of 1993.
>
> HAVA established the Standards Board and the Board of Advisors to advise EAC. The law also established the Technical Guidelines Development Committee to assist EAC in the development of voluntary voting system guidelines.
>
> The four EAC commissioners are appointed by the president and confirmed by the U.S. Senate. EAC is required to submit an annual report to Congress as well as testify periodically about HAVA progress and related issues. The commission also holds public meetings and hearings to inform the public about its progress and activities.
>
> HAVA also requires that EAC provide certification, decertification, and recertification of voting systems and the accreditation of testing laboratories, marking the first time the federal government will be responsible for these

Fulton County Pennsylvania
Election Assessment

activities. Under HAVA, the National Institute of Standards and Technology (NIST) will assist the EAC with the certification program through its National Voluntary Laboratory Accreditation Program (NVLAP), and will provide recommendations to the EAC regarding laboratory accreditation. EAC will make the final decision to accredit laboratories based upon the information provided by NVLAP. ***Participation by states in EAC's certification program is voluntary; however, over 40 states currently require EAC certification, or some component of the EAC program, for the voting systems used in their jurisdictions.*** Highlighting provided by WAKE TSI.

The purpose of EAC's national voting system certification program is to independently verify that voting systems comply with the functional capabilities, accessibility, and security requirements necessary to ensure the integrity and reliability of voting system operation, as established in the Voluntary Voting System Guidelines (VVSG).

11.2 State Certification

The Dominion Democracy Suite 5.5A was certified on 01/17/2019 for the General and Primary Elections occurring in 2019. The Secretary appointed SLI Global Solutions (SLI) and the Center for Civic Design (CCD) as professional consultants to conduct the examination of Democracy Suite 5.5. The certification process was approved by, and the report was approved and signed by Acting Secretary of the Commonwealth, Kathy Bookvar.

11.3 County Implementation Attestation (IA)

As part of our review of the Dominion certifications at each of the three (3) required levels WAKE TSI requested the completed and signed Attestation Form from the County which should have been created with Dominion when they installed the Fulton County Systems in 2019. The form in Appendix G is the Pennsylvania template for the IA Form, which is then followed by the completed Dominion form.

The purpose of the Attestation is to indicate that the Vendor (Dominion) has provided the components required that have previously been certified by the Department of State of the Commonwealth of Pennsylvania.

The County upgraded a scanner, but a second attestation was not completed at that time. These forms are proof that that system has been installed completely and accurately and must be completed with each system change.

11.3.1 Components not provided

Dominion "owes" the County training manuals, training and system manuals. The Election Commission expects that Dominion will provide those materials and training prior to the 2021 Municipal Primary which occurs in May 2021.

The Vendor has not yet provided training materials or manuals for information technology support of the system.

Fulton County Pennsylvania
Election Assessment

WAKETSI

11.3.2 Dominion statement about certification

When WAKETSI first sought to review the Implementation Attestation document the Election Commission and the Election Director could not immediately locate the IA form. Since they could not find it in their own records the Election Commission asked Dominion for a copy of this form. Dominion then told the County that it had not been completed because it was "optional". This statement does not agree with "Section IV Conditions for Certification" of the "Dominion Democracy Final Report scanned with signature 020119.pdf" page 40 that states the following:

> "Given the results of the examination that occurred in October and December 2018 and the findings of the Examiners as set forth in their reports, the Secretary of the Commonwealth certifies the Democracy Suite 5.5A subject to the following conditions:"

Section IV, Item

> "K. All jurisdictions implementing Democracy Suite 5.5A **must** work with Dominion to ensure that **only** the certified system configuration is *installed on purchase or anytime a system component is replaced or upgraded.* Jurisdictions must as part of their user acceptance test verify the implementation to ensure that the components, software and firmware belong to the certified system. Jurisdictions **must** also perform a trusted build validation as part of the election preparation activities and post-election canvass activities utilizing the vendor supplied methods of validation and verification of voting system integrity. A sample format that can be used for the attestation is added as Attachment C to this document."

The use of the word MUST is a legal term that is enforceable. *Fulton County had their original Implementation Attestation completed but it would seem that they have never had a Logic and Accuracy test documented.* This is not to say whether or not the L&A testing has been completed, but there is nothing documenting that the process was completed.

It would seem that Dominion does not retain the documentation of what work they are completing even when that documentation is of great importance to the election integrity of this Country.

11.3.3 Logic & Accuracy Testing Requirement

The L&A testing is a before and after certification that is supposed to occur within 15 days before and within 15 days after every election. This is a technology certification to ensure that the system is able to read the scanned document and apply the Vote correctly to the candidate that was chosen.

> Section IV Item E REQUIRES that: "All jurisdictions implementing the Democracy Suite 5.5A need to carry out a full Logic and Accuracy test on each device without fail and **maintain evidence of Logic and Accuracy (L&A)** testing in accordance with the statutory requirements for pre-election and post-election

Fulton County Pennsylvania
Election Assessment

testing. Jurisdictions must include audio ballots and accessible devices during L&A testing. The Department does not recommend automated L&A testing, and discourages the use of preprinted ballots provided by vendors. All components being used on election day, including any Electronic Poll Books being used, must be part of the L&A testing. Counties must ensure that the L&A test cases include all applicable scenarios of the PA straight party method identified in Attachment C to the Directive for electronic voting systems published by BCEL on September 11,2017.

As WAKETSI stated in the previous section no L&A testing has been documented. No documented attestation form nor L&A can be provided from when a scanner was upgraded. These may seem like minor issues until one understands the impacts that issues of accurate scanning have on the election process. The positions of each candidates voting circle is programmed into the Election Management System. If the alignment of that circle is off by a tiny fraction of an inch the system will not be able to properly read the ballot. The ballot will then be moved to adjudication where the Voter's selection of candidate is open to "interpretation" by the person or persons conducting the adjudication process.

A simple human error, or a bad actor, could cause huge issues with accurate ballot counting if it is not caught by proper testing both before and after an election, as is required by the Commonwealth of Pennsylvania. This problem falls not only on Dominion, but also on the Commonwealth's Department of State for not enforcing their own certification guidelines.

11.3.4 Dominion addition of non-certified software

Dominion has added the Microsoft SQL Server Data Tools (SSDT) to their installations. This toolset is not an authorized portion of the system as certified by the EAC or the Commonwealth of Pennsylvania.

Fulton County Pennsylvania
Election Assessment

12 Appendix A – Sample Ballots

The enclosed sample ballot is from the Fulton County web site and are downloadable from the web site in PDF format.

The watermark of "SPECIMEN" is removable using Adobe Acrobat or a similar tool. The only difference between the Sample Ballots and the Regular Ballots is the machine-readable precinct Identification on the Actual ballots is not printed on the Actual Ballots.

We provided a sample for Ayr Township Precinct as the others follow the same standards as does this sample.

The ballots for all precincts contained the same election information for contests and candidates.

**Fulton County Pennsylvania
Election Assessment**

13 Appendix B – Ballot Scanning Log

Fulton County Pennsylvania
Election Assessment

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14 Appendix C – Ballot Tally & Tracking Template

This is the template used for tracking paper ballots and the paper for the BMD devices which is distributed to each Precinct and then returned to the County offices after the election was completed.

Exact counts are kept ensuring that no paper for the BMD or printed election ballots are unaccounted for.

**Fulton County Pennsylvania
Election Assessment**

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15 Appendix D – Security Tag Tracking Template

This template is utilized when security tags are removed and then replaced from the ballot carts, BMD devices or supply carts.

ELECTION BOXES TAG CONFIRMATION REPORT

	Machine		Election Survey Bag (Blue)						Voted Ballot Box (Clear)		
	TAGS ALREADY ON THE MACHINE		CURRENT "DO NOT REMOVE" Tag		CURRENT Sleeve Tag		End of night Tag		BOX IS EMPTY	SLEEVE TAG	BALLOT SHEET TAG
			NUMBER	INITIALS	NUMBER	INITIALS	NUMBER	INITIALS	INITIALS	NUMBER	INITIALS
Ayr											
Belfast											
Bethel											
Brush Creek											
Dublin											
Licking Creek											
McConnellsburg											
Taylor											
Thompson											
Todd											
Union											
Valley Hi	██	██									
Wells	██	██									
If it does not match, write the correct seal number above it.											
Sign and date this form to verify security tag numbers											
	JUDGE OF ELECTION SIGNATURE		INSPECTOR OF ELECTION SIGNATURE			INSPECTOR OF ELECTION SIGNATURE					
	DATE			DATE			DATE				

19 February 2021

**Fulton County Pennsylvania
Election Assessment**

WAKETSI

16 Appendix E – County General Certificate of Results

Official County report of election results signed by all required parties.

GENERAL CERTIFICATE OF RESULT

OF ALL VOTES CAST

AT THE

2020

GENERAL

ELECTION

November 3, 2020

**Fulton County Pennsylvania
Election Assessment**

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CERTIFICATION OF COMPUTATION OF ELECTION RESULTS

Computation 1 Cover Sheet

The following is the computation of all election day ballots, provisional ballots, military and overseas ballots, and only those civilian absentee and mail-in ballots received by 8:00 pm on November 3, 2020.

Fulton County Pennsylvania
Election Assessment

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DATE 11/00/2020 17-47-07
PAGE 1

PENNSYLVANIA
DEPARTMENT OF STATE

2020 GENERAL Election BALLOT CERTIFICATION

FULTON COUNTY (29)

BALLOT POSITION AND ELECTION RESULT SECTION   PART 1
OFFICE POSITIONS SHALL APPEAR ON VOTING MACHINE OR PAPER BALLOT IN SAME ORDER AS LISTED

INSERT VOTES IN DIGITS

PRESIDENT OF THE UNITED STATES
VOTE FOR ONE   DISTRICT STATEWIDE

JOSEPH R BIDEN	DEMOCRATIC	
1209 BARLEY MILL ROAD		
WILMINGTON DE 19807-		1,085
VICE-PRESIDENT: KAMALA D HARRIS		
DONALD J TRUMP	REPUBLICAN	
1100 SOUTH OCEAN BOULEVARD		
PALM BEACH FL 33480-		6,884
VICE-PRESIDENT: MICHAEL R PENCE		
JO JORGENSEN	LIBERTARIAN	
300 BUTLER AVENUE		
GREENVILLE SC 29601-		69
VICE-PRESIDENT: JEREMY SPIKE COHEN		
CARROLL, BRIAN	WRITE-IN	
		1
HAWKINS, HOWIE	WRITE-IN	
		3

19 February 2021

Fulton County Pennsylvania
Election Assessment

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DATE 11/20/2020 17:47:07
PAGE 2

2020 GENERAL Election BALLOT CERTIFICATION

FULTON COUNTY (29)

BALLOT POSITION AND ELECTION RESULT SECTION   PART 1
OFFICE POSITIONS SHALL APPEAR ON VOTING MACHINE OR PAPER BALLOT IN SAME ORDER AS LISTED

INSERT VOTES IN DIGITS

ATTORNEY GENERAL
VOTE FOR ONE   DISTRICT   STATEWIDE

JOSH SHAPIRO	DEMOCRATIC	
1550 CLOVERLY LN		
JENKINTOWN	PA 19046	1,186
HEATHER HEIDELBAUGH	REPUBLICAN	
141 WOODHAVEN DRIVE		
PITTSBURGH	PA 15228	6,557
DANIEL WASSMER	LIBERTARIAN	
1433 ROUTE 590		
HOWLEY	PA 18428	114
RICHARD L WEISS	GREEN	
107 OLD VILLAGE LANE		
BETHEL PARK	PA 15102	37
SIMPSON STURGILL	WRITE-IN	
		1

19 February 2021

Fulton County Pennsylvania
Election Assessment

WAKETSI
ARCHITECTING IT FOR THE FUTURE

DATE 11/20/2020   17:47:07
PAGE 3

2020 GENERAL Election BALLOT CERTIFICATION

FULTON COUNTY (29)

BALLOT POSITION AND ELECTION RESULT SECTION   PART 1
OFFICE POSITIONS SHALL APPEAR ON VOTING MACHINE OR PAPER BALLOT IN SAME ORDER AS LISTED

INSERT VOTES IN DIGITS

AUDITOR GENERAL
VOTE FOR ONE   DISTRICT   STATEWIDE

NINA AHMAD			DEMOCRATIC	
405 E GOWEN AVE				
PHILADELPHIA	PA	19119-		937

TIMOTHY DEFOOR			REPUBLICAN	
1300 ELLIS DRIVE				
HARRISBURG	PA	17110		5,996

JENNIFER MOORE			LIBERTARIAN	
200 LOVERS LN				
UPPER PROVIDENCE	PA	19453-		179

OLIVIA FAISON			GREEN	
5822 SPRUCE ST				
PHILADELPHIA	PA	19139		49

STRINGS BILLY			WRITE-IN	
				1

Fulton County Pennsylvania
Election Assessment

WAKETSI
Architecting IT for the Future

DATE 11/09/2020 17:47:07
PAGE 4

2020 GENERAL Election BALLOT CERTIFICATION

FULTON COUNTY (29)

BALLOT POSITION AND ELECTION RESULT SECTION   PART 1
OFFICE POSITIONS SHALL APPEAR ON VOTING MACHINE OR PAPER BALLOT IN SAME ORDER AS LISTED

INSERT VOTES IN DIGITS

STATE TREASURER
VOTE FOR ONE   DISTRICT STATEWIDE

JOE TORSELLA		DEMOCRATIC	
602 CREEK LANE			
FLOURTOWN	PA 19031		1,040
STACY L GARRITY		REPUBLICAN	
383 GATEWAY INDUSTRIAL PARK ROAD			
ATHENS	PA 18810-		6,567
JOE SOLOSKI		LIBERTARIAN	
141 BUCKHORN RD			
PORT MATILDA	PA 16871-		122
TIMOTHY RUNKLE		GREEN	
16 TEAKWOOD CIRCLE			
ELIZABETHTOWN	PA 17022-		41
STAPLETON, CHRIS		WRITE-IN	
			1

Fulton County Pennsylvania
Election Assessment

WAKETSI
Architecting IT for the Future

DATE 11/20/2020 17:47:07
PAGE 5

2020 GENERAL Election BALLOT CERTIFICATION

FULTON COUNTY (29)

BALLOT POSITION AND ELECTION RESULT SECTION   PART 1
OFFICE POSITIONS SHALL APPEAR ON VOTING MACHINE OR PAPER BALLOT IN SAME ORDER AS LISTED

INSERT VOTES IN DIGITS

REPRESENTATIVE IN CONGRESS
VOTE FOR ONE   DISTRICT 13

TODD ROWLEY	DEMOCRATIC	
742 CAMP RUN ROAD		
SOMERSET PA 15601		1,055
JOHN JOYCE	REPUBLICAN	
198 STONEHEDGE ROAD		
HOLLIDAYSBURG PA 16648		6,783
GRAHAM, JOHN R. III	WRITE-IN	
		1
GUNNELL, JAMES	WRITE-IN	
		1

19 February 2021

Fulton County Pennsylvania
Election Assessment

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DATE : 11/30/2020   17:47:07
PAGE : 8

2020 GENERAL Election BALLOT CERTIFICATION

FULTON COUNTY (29)

BALLOT POSITION AND ELECTION RESULT SECTION   PART I
OFFICE POSITIONS SHALL APPEAR ON VOTING MACHINE OR PAPER BALLOT IN SAME ORDER AS LISTED

INSERT VOTES IN DIGITS

REPRESENTATIVE IN THE GENERAL ASSEMBLY
VOTE FOR ONE   DISTRICT 78

JESSE TOPPER		REPUBLICAN	
242 E SIMPSON ST			
BEDFORD	PA 15522		7,261

Fulton County Pennsylvania
Election Assessment

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DATE 11/20/2020 17:47:07
PAGE 7

2020 GENERAL Election BALLOT CERTIFICATION

FULTON COUNTY (29)

BALLOT POSITION AND ELECTION RESULT SECTION   PART IV
USE THIS PAGE TO RECORD VOTE TOTALS AND CANDIDATE INFORMATION FOR WRITE-IN VOTES CAST

INSERT VOTE IN DIGITS

OFFICE	PRESIDENT OF THE UNITED STATES	DISTRICT	Statewide
NAME	Scattered		
ADDRESS			
CITY	STATE ZIP		9

OFFICE	PRESIDENT OF THE UNITED STATES	DISTRICT	Statewide
NAME	Carroll, Brian		
ADDRESS			
CITY	STATE ZIP		1

OFFICE	PRESIDENT OF THE UNITED STATES	DISTRICT	Statewide
NAME	Hawkins, Howie		
ADDRESS			
CITY	STATE ZIP		3

FULTON COUNTY (29)

BALLOT POSITION AND ELECTION RESULT SECTION   PART IV
USE THIS PAGE TO RECORD VOTE TOTALS AND CANDIDATE INFORMATION FOR WRITE-IN VOTES CAST

INSERT VOTE IN DIGITS

OFFICE	ATTORNEY GENERAL	DISTRICT	Statewide
NAME	Simpson, Sturgill		
ADDRESS			
CITY	STATE ZIP		1

FULTON COUNTY (29)

BALLOT POSITION AND ELECTION RESULT SECTION   PART IV
USE THIS PAGE TO RECORD VOTE TOTALS AND CANDIDATE INFORMATION FOR WRITE-IN VOTES CAST

INSERT VOTE IN DIGITS

OFFICE	AUDITOR GENERAL	DISTRICT	Statewide
NAME	Scattered		
ADDRESS			
CITY	STATE ZIP		2

Fulton County Pennsylvania
Election Assessment

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DATE 11000000 17 47 07
PAGE 8

2020 GENERAL Election BALLOT CERTIFICATION

FULTON COUNTY (29)

BALLOT POSITION AND ELECTION RESULT SECTION   PART IV
USE THIS PAGE TO RECORD VOTE TOTALS AND CANDIDATE INFORMATION FOR WRITE-IN VOTES CAST
INSERT VOTE IN DIGITS

OFFICE	AUDITOR GENERAL	DISTRICT	Statewide
NAME	Stringa, Billy		
ADDRESS			
CITY	STATE ZIP		1

FULTON COUNTY (29)

BALLOT POSITION AND ELECTION RESULT SECTION   PART IV
USE THIS PAGE TO RECORD VOTE TOTALS AND CANDIDATE INFORMATION FOR WRITE-IN VOTES CAST
INSERT VOTE IN DIGITS

OFFICE	STATE TREASURER	DISTRICT	Statewide
NAME	Stapleton, Chris		
ADDRESS			
CITY	STATE ZIP		1

FULTON COUNTY (29)

BALLOT POSITION AND ELECTION RESULT SECTION   PART IV
USE THIS PAGE TO RECORD VOTE TOTALS AND CANDIDATE INFORMATION FOR WRITE-IN VOTES CAST
INSERT VOTE IN DIGITS

OFFICE	REPRESENTATIVE IN CONGRESS	DISTRICT	13th Congressional District
NAME	Scattered		
ADDRESS			
CITY	STATE ZIP		1

OFFICE	REPRESENTATIVE IN CONGRESS	DISTRICT	13th Congressional District
NAME	Graham, John R III		
ADDRESS			
CITY	STATE ZIP		1

OFFICE	REPRESENTATIVE IN CONGRESS	DISTRICT	13th Congressional District
NAME	Gunnet, James		
ADDRESS			
CITY	STATE ZIP		1

Fulton County Pennsylvania
Election Assessment

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DATE 11/20/2020 17:47:07
PAGE 9

2020 GENERAL Election BALLOT CERTIFICATION

FULTON COUNTY (28)

BALLOT POSITION AND ELECTION RESULT SECTION   PART IV
USE THIS PAGE TO RECORD VOTE TOTALS AND CANDIDATE INFORMATION FOR WRITE-IN VOTES CAST

INSERT VOTE IN DIGITS

OFFICE	REPRESENTATIVE IN THE GENERAL ASSEMBLY	DISTRICT	78th Legislative District
NAME	Scattered		
ADDRESS			
CITY	STATE ZIP		63

19 February 2021

Fulton County Pennsylvania
Election Assessment

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DATE 11/00/2020 17:47:07
PAGE 11

2020 GENERAL Election BALLOT CERTIFICATION

OFFICE OF THE COUNTY BOARD OF ELECTIONS
CERTIFICATION AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA
FULTON COUNTY (29)

COUNTY OF FULTON   McCONNELLSBURG PA 17233

WE HEREBY CERTIFY THAT THESE 11 PAGES ARE THE OFFICIAL RETURNS AS THEY APPEAR ON RECORD OF
THE VOTES CAST AT THE GENERAL ELECTION HELD 11/3/2020

IN WITNESS WHEREOF, WE HAVE HEREUNTO SET OUR HANDS AND SEAL OF OFFICE THIS
_____ 23 ____ DAY OF __ November ____ 2020

SEAL

COUNTY BOARD OF ELECTIONS

ATTEST

CLERK

Fulton County Pennsylvania
Election Assessment

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Page 1 of 4   11/23/2020 11:12:17 AM

Election Summary Report

General Election
Fulton County
November 03, 2020
Summary for: All Contests, All Districts, All Tabulators, All Counting Groups

Precincts Reported: 13 of 13 (100.00%)
Registered Voters 8,034 of 9,829 (81.74%)
Ballots Cast 8,034

Presidential Electors (Vote for 1)

Precincts Reported: 13 of 13 (100.00%)

		Election Day	Mail-in	Absentee	Provisional	Total	
Times Cast		6,681	1,226	0	127	8,034 / 9,829	81.74%
Candidate	Party	Election Day	Mail-in	Absentee	Provisional	Total	
Joseph R. Biden / Kamala D Harris	DEM	564	511	0	10	1,085	
Donald J. Trump / Michael R Pence	REP	6,031	679	0	114	6,824	
Jo Jorgensen / Jeremy Spike Cohen	LIB	46	21	0	1	68	
Total Votes		6,648	1,216	0	126	7,990	
		Election Day	Mail-in	Absentee	Provisional	Total	
Howie Hawkins	WRITE-IN	2	0	0	1	3	
Kanye West	WRITE-IN	1	0	0	0	1	
Brian Carroll	WRITE-IN	1	0	0	0	1	
Colon Powell	WRITE-IN	1	0	0	0	1	
Buttigieg	WRITE-IN	1	0	0	0	1	
Willie Nelson	WRITE-IN	1	0	0	0	1	
Michael R Pence	WRITE-IN	0	3	0	0	3	
Bernie Sanders	WRITE-IN	0	2	0	0	2	
Unresolved Write-In		0	0	0	0	0	

Fulton County Pennsylvania
Election Assessment

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Page 2 of 4   19/2/2020 11:12:15 AM

Attorney General (Vote for 1)

Precincts Reported: 13 of 13 (100.00%)

		Election Day	Mail-In	Absentee	Provisional	Total	
Times Cast		6,681	1,226	0	127	8,034 / 9,829	81.74%
Candidate	**Party**	**Election Day**	**Mail-In**	**Absentee**	**Provisional**	**Total**	
Josh Shapiro	DEM	596	494	0	16	1,106	
Heather Heidelbaugh	REP	5,782	667	0	108	6,557	
Daniel Wassmer	LIB	88	25	0	1	114	
Richard L Weiss	GRN	28	8	0	1	37	
Total Votes		6,495	1,194	0	126	7,815	
		Election Day	**Mail-In**	**Absentee**	**Provisional**	**Total**	
Edna H Strait	WRITE-IN	0	0	0	0	0	
Sturgill Simpson	WRITE-IN	1	0	0	0	1	
Unresolved Write-In		1	0	0	0	1	

Auditor General (Vote for 1)

Precincts Reported: 13 of 13 (100.00%)

		Election Day	Mail-In	Absentee	Provisional	Total	
Times Cast		6,681	1,226	0	127	8,034 / 9,829	81.74%
Candidate	**Party**	**Election Day**	**Mail-In**	**Absentee**	**Provisional**	**Total**	
Nina Ahmad	DEM	479	446	0	12	937	
Timothy DeFoor	REP	5,796	693	0	107	6,596	
Jennifer Moore	LIB	140	33	0	6	179	
Olivia Faison	GRN	35	14	0	0	49	
Total Votes		6,453	1,186	0	125	7,764	
		Election Day	**Mail-In**	**Absentee**	**Provisional**	**Total**	
Edna H Strait	WRITE-IN	1	0	0	0	1	
Angie Zmobile	WRITE-IN	1	0	0	0	1	
Billy Springs	WRITE-IN	1	0	0	0	1	
Unresolved Write-In		0	0	0	0	0	

State Treasurer (Vote for 1)

Precincts Reported: 13 of 13 (100.00%)

		Election Day	Mail-In	Absentee	Provisional	Total	
Times Cast		6,681	1,226	0	127	8,034 / 9,829	81.74%
Candidate	**Party**	**Election Day**	**Mail-In**	**Absentee**	**Provisional**	**Total**	
Joe Torsella	DEM	555	472	0	13	1,040	
Stacy L Garrity	REP	5,768	680	0	109	6,557	
Joe Soloski	LIB	95	25	0	2	122	
Timothy Runkle	GRN	31	10	0	0	41	
Total Votes		6,450	1,187	0	124	7,761	
		Election Day	**Mail-In**	**Absentee**	**Provisional**	**Total**	
Chris Stapleton	WRITE-IN	1	0	0	0	1	
Unresolved Write-In		0	0	0	0	0	

Fulton County Pennsylvania
Election Assessment

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Representative in Congress 13th Congressional District (Vote for 1)

Precincts Reported 13 of 13 (100.00%)

		Election Day	Mail-In	Absentee	Provisional	Total	
Times Cast		6,661	1,226	0	127	8,034 / 9,829	81.74%
Candidate	Party	Election Day	Mail-In	Absentee	Provisional	Total	
Todd Rowley	DEM	574	463	0	18	1,055	
John Joyce	REP	5,935	739	0	109	6,783	
Total Votes		6,512	1,202	0	127	7,841	
		Election Day	Mail-In	Absentee	Provisional	Total	
John R Graham III	WRITE-IN	1	0	0	0	1	
James Gunnell	WRITE-IN	1	0	0	0	1	
Cody Richards	WRITE-IN	1	0	0	0	1	
Unresolved Write-In		0	0	0	0	0	

Representative in the General Assembly 78th Legislative District (Vote for 1)

Precincts Reported 13 of 13 (100.00%)

		Election Day	Mail-In	Absentee	Provisional	Total	
Times Cast		6,681	1,226	0	127	8,034 / 9,829	81.74%
Candidate	Party	Election Day	Mail-In	Absentee	Provisional	Total	
Jesse Topper	REP	6,216	932	0	113	7,261	
Total Votes		6,244	966	0	114	7,324	
		Election Day	Mail-In	Absentee	Provisional	Total	
Judy Ward	WRITE-IN	1	0	0	0	1	
Jack Hendricks	WRITE-IN	1	0	0	0	1	
Gary L Shives	WRITE-IN	1	0	0	0	1	
Gerald R Strait	WRITE-IN	2	0	0	0	2	
John Dailey	WRITE-IN	2	0	0	0	2	
Cheryna Cutshall	WRITE-IN	1	0	0	0	1	
Charles Glenn	WRITE-IN	1	0	0	0	1	
Debra Bowgubum	WRITE-IN	1	0	0	0	1	
Tom Kirkman	WRITE-IN	1	0	0	0	1	
Chelsea Downy	WRITE-IN	1	0	0	0	1	
Lindsay Gombus	WRITE-IN	1	0	0	0	1	
Dick Newman	WRITE-IN	1	0	0	0	1	
Charin Mountz	WRITE-IN	1	0	0	0	1	
Irvin Dasher	WRITE-IN	1	0	0	0	1	
Emily Best	WRITE-IN	1	1	0	0	2	
Robert Smedley	WRITE-IN	1	0	0	0	1	
Anthony Strait	WRITE-IN	1	0	0	0	1	
John L Rieker	WRITE-IN	1	0	0	0	1	
Charles Myers III	WRITE-IN	1	0	0	0	1	
Mike Tyson	WRITE-IN	1	0	0	0	1	
Hillary Clinton	WRITE-IN	1	0	0	0	1	
Christine F Shelley	WRITE-IN	1	0	0	0	1	
Ralph Doyle	WRITE-IN	1	0	0	0	1	
Dawn Bergensmith	WRITE-IN	1	0	0	0	1	

Fulton County Pennsylvania
Election Assessment

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Page 4 of 4   11/22/2020 11:10:17 AM

		Election Day	Mail-In	Absentee	Provisional	Total
James R Harvey	WRITE-IN	1	0	0	0	1
Scott Risbon	WRITE-IN	1	0	0	0	1
Darlene Joy Desher	WRITE-IN	0	2	0	0	2
Joseph R Biden	WRITE-IN	0	1	0	0	1
John Wayne	WRITE-IN	0	1	0	0	1
Logan Dean	WRITE-IN	0	1	0	0	1
Anthony Fauci	WRITE-IN	0	1	0	0	1
Deb Baughman	WRITE-IN	0	1	0	0	1
Gary Decker	WRITE-IN	0	1	0	0	1
Paula Shives	WRITE-IN	0	1	0	0	1
Ben Ray	WRITE-IN	0	1	0	0	1
Jo Jorgensen	WRITE-IN	0	1	0	0	1
Sam Doctor	WRITE-IN	0	1	0	0	1
Karen L Emmons	WRITE-IN	0	1	0	0	1
Armando Mevyner	WRITE-IN	0	1	0	0	1
Stephanie Sanger	WRITE-IN	0	1	0	0	1
Deborah Baughman	WRITE-IN	0	5	0	0	5
Greg Peck	WRITE-IN	0	1	0	0	1
Amy Conner	WRITE-IN	0	1	0	0	1
Kanye West	WRITE-IN	0	1	0	0	1
Joe Erwin	WRITE-IN	0	2	0	0	2
Bruce True	WRITE-IN	0	2	0	0	2
Todd Hoffner	WRITE-IN	0	1	0	0	1
Mark Pollos	WRITE-IN	0	1	0	0	1
Ronald L Davis	WRITE-IN	0	1	0	0	1
Judy Davis	WRITE-IN	0	1	0	0	1
Janet Diaz	WRITE-IN	0	1	0	0	1
Nadine Fox	WRITE-IN	0	1	0	0	1
Sanders	WRITE-IN	0	0	0	1	1
Unresolved Write-In		0	0	0	0	0

19 February 2021

**Fulton County Pennsylvania
Election Assessment**

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CERTIFICATION OF COMPUTATION OF ELECTION RESULTS

Computation 2 Cover Sheet

The following is the computation of ballots received by mail between November 4, 2020 and November 6, 2020 that were postmarked on or before November 3, 2020.

Fulton County Pennsylvania
Election Assessment

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Page 1 of 4

11/10/2020 11:42:49 AM

Election Summary Report

General Election
Fulton County
November 03, 2020

Summary for: All Contests, All Districts, post-election-day mail-in, post-election-day absentee, All Counting Groups

Precincts Reported 0 of 13 (0.00%)
Registered Voters 11 of 9,829 (0.11%)
Ballots Cast 11

Presidential Electors (Vote for 1)

Precincts Reported 0 of 11 (0.00%)

			Total	
Times Cast			11 / 9,829	0.11%
Candidate	Party		Total	
Joseph R. Biden / Kamala D. Harris	DEM		1	
Donald J. Trump / Michael R. Pence	REP		9	
Jo Jorgensen / Jeremy Spike Cohen	LIB		1	
Total Votes			11	
			Total	
Howie Hawkins	WRITE-IN		0	
Kanye West	WRITE-IN		0	
Colon Powell	WRITE-IN		0	
Buttigieg	WRITE-IN		0	
Willie Nelson	WRITE-IN		0	
Michael R Pence	WRITE-IN		0	
Bernie Sanders	WRITE-IN		0	
Brian Carroll	WRITE-IN		0	
Unresolved Write-In			0	

19 February 2021

Fulton County Pennsylvania
Election Assessment

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Page 2 of 4

11/10/2020 11:42:49 AM

Attorney General (Vote for 1)

Precincts Reported 0 of 13 (0.00%)

		Total	
Times Cast		11 / 9,829	0.11%
Candidate	Party	Total	
Josh Shapiro	DEM	3	
Heather Heidelbaugh	REP	6	
Daniel Wassmer	LIB	1	
Richard L. Weiss	GRN	0	
Total Votes		10	
		Total	
Sturgill Simpson	WRITE-IN	0	
Edna M Strait	WRITE-IN	0	
Unresolved Write-In		0	

Auditor General (Vote for 1)

Precincts Reported 0 of 13 (0.00%)

		Total	
Times Cast		11 / 9,829	0.11%
Candidate	Party	Total	
Nina Ahmad	DEM	1	
Timothy DeFoor	REP	9	
Jennifer Moore	LIB	0	
Olivia Faison	GRN	0	
Total Votes		10	
		Total	
Angie Zimmermann	WRITE-IN	0	
Billy Strings	WRITE-IN	0	
Edna M Strait	WRITE-IN	0	
Unresolved Write-In		0	

State Treasurer (Vote for 1)

Precincts Reported 0 of 11 (0.00%)

		Total	
Times Cast		11 / 9,829	0.11%
Candidate	Party	Total	
Joe Torsella	DEM	4	
Stacy L. Garrity	REP	6	
Joe Soloski	LIB	1	
Timothy Runkle	GRN	0	
Total Votes		11	
		Total	
Chris Stapleton	WRITE-IN	0	
Unresolved Write-In		0	

19 February 2021

Fulton County Pennsylvania
Election Assessment

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Page 3 of 4

11/10/2020 11:42:44 AM

Representative in Congress 13th Congressional District (Vote for 1)

Precincts Reported 0 of 11 (0.00%)

		Total	
Times Cast		11 / 9,829	0.11%
Candidate	Party	Total	
Todd Rowley	DEM	2	
John Joyce	REP	8	
Total Votes		10	
		Total	
John R Graham #	WRITE-IN	0	
James Gunnett	write-in	0	
Cody Richards	WRITE IN	0	
	WRITE IN	0	
Unresolved Write-In		0	

Representative in the General Assembly 78th Legislative District (Vote for 1)

Precincts Reported 0 of 11 (0.00%)

		Total	
Times Cast		11 / 9,829	0.11%
Candidate	Party	Total	
Jesse Topper	REP	10	
Total Votes		10	
		Total	
Judy Ward	WRITE-IN	0	
Judy Davis	WRITE-IN	0	
Sanders	WRITE-IN	0	
Janet Diaz	WRITE-IN	0	
Armando Meynar	WRITE-IN	0	
Jack Hendricks	WRITE-IN	0	
Dick Newman	WRITE-IN	0	
Robert Smudkey	WRITE-IN	0	
Christine F Shelley	WRITE-IN	0	
Joseph R Baden	WRITE-IN	0	
John Wayne	WRITE-IN	0	
Ralph Doyle	WRITE-IN	0	
Anthony Stead	WRITE-IN	0	
Charvin Mountz	WRITE-IN	0	
Gary L Shives	WRITE-IN	0	
Stephanie Swiger	WRITE-IN	0	
Nadine Fox	WRITE-IN	0	
Deborah Baughman	WRITE-IN	0	
	WRITE-IN	0	
Chenna Cutshall	WRITE-IN	0	
Irvin Dasher	WRITE-IN	0	
John L Barber	WRITE-IN	0	
Dawn Bergenstith	WRITE-IN	0	

Fulton County Pennsylvania
Election Assessment

Page 4 of 4

11/10/2020 11:42:49 AM

		Total
Logan Dean	WRITE-IN	0
Anthony Fauci	WRITE-IN	0
Emily Best	WRITE-IN	0
Charles Myers III	WRITE-IN	0
Charles Glenn	WRITE-IN	0
John Duffey	WRITE-IN	0
Greg Peck	WRITE-IN	0
Amy Conner	WRITE-IN	0
Deb Baughman	WRITE-IN	0
Debra Bowguburn	WRITE-IN	0
Mike Tyson	WRITE-IN	0
Tom Kirkman	WRITE-IN	0
Gary Decker	WRITE-IN	0
Kanye West	WRITE-IN	0
Joe Exotic	WRITE-IN	0
Paula Shaws	WRITE-IN	0
Chelsea Downy	WRITE-IN	0
Hillary Clinton	WRITE-IN	0
James R Harvey	WRITE-IN	0
Scott Rustion	WRITE-IN	0
Lindsay Gombus	WRITE-IN	0
Ben Ray	WRITE-IN	0
Bruce True	WRITE-IN	0
Todd Hoffner	WRITE-IN	0
Jd Jorgensen	WRITE-IN	0
Sam Doctor	WRITE-IN	0
Mark Poldus	WRITE-IN	0
Karen L Emmons	WRITE-IN	0
Unresolved Write-In		0

19 February 2021

Fulton County Pennsylvania
Election Assessment

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CERTIFICATION OF COMPUTATION OF ELECTION RESULTS

Computation 3

The following is the computation of ballots received by mail between November 4, 2020 and November 6, 2020 that did not bear a postmark.

N/A

Fulton County Pennsylvania
Election Assessment

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CERTIFICATION OF COMPUTATION OF ELECTION RESULTS

Computation 4

The following is the computation of ballots received by mail between November 4, 2020 and November 6, 2020 where the postmark was illegible. N/A

Fulton County Pennsylvania
Election Assessment

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2020 General Election
November 3, 2020

Fulton County, Pennsylvania

CERTIFICATION OF COMPUTATION OF ELECTION RESULTS

We the undersigned, Clerks appointed to compute the votes cast at the General Election aforesaid, do hereby certify that the within statement is a correct computation of the votes returned as cast for federal and state offices in the several Election Districts of the County at the General Election held on the 3rd day of November 2020.

ATTESTED: (to be signed by all the Clerks)

_____

_____

Director of Elections

_____

SIGNED this_____11th_____day of November, 2020

_____   **County Board of Elections of**

_____   **(County) County, Pennsylvania**

FINAL CERTIFICATION

And now, five days after the completion of the within computation of votes, no petition for a recount or recanvass having been filed in accordance with the provisions of the Elections code, or in case of petition, the revision directed by the Court of Common Pleas having been made, we certify the within return of votes cast as being true and correct.

SIGNED this_____23rd_____day of November, 2020

_____   **County Board of Elections of**

_____   **(County) County, Pennsylvania**

_____

**Fulton County Pennsylvania
Election Assessment**

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17 Appendix F - BMD Ballot Printout

The picture below is of a ballot printed from one of Belfast Township Precinct BMD devices. The printed ballot meets all requirements of both the HAVA and Commonwealth statutes.

The only possible concern is that the scanner / tabulator reads the machine readable QR code not the human readable printing.

As long as the BMD is programmed correctly this should not be of concern.

**Fulton County Pennsylvania
Election Assessment**

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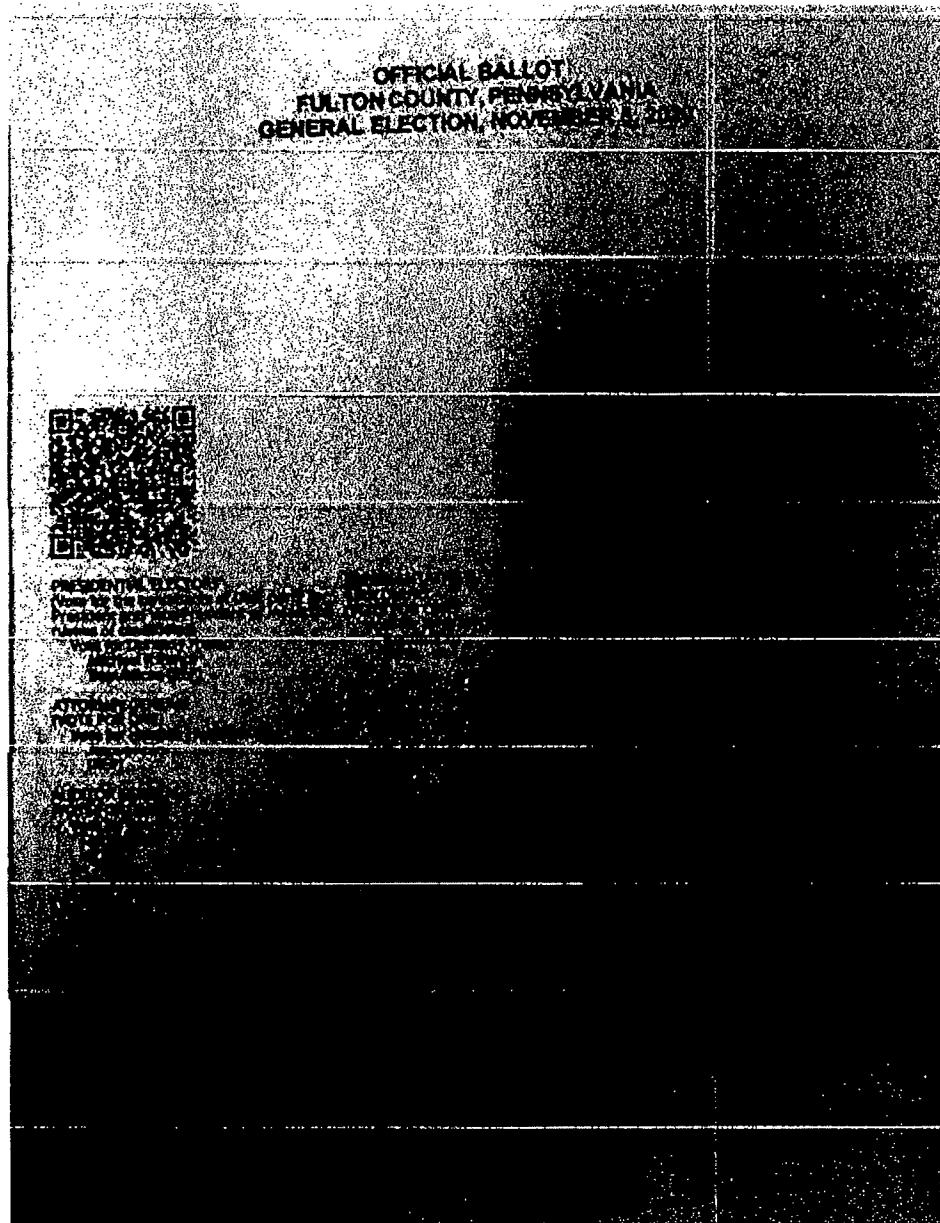
18 Appendix G – County Implementation Attestation Form

This is the form which signifies that the County received all components of the Election Management System from the vendor Dominion when the EMS was installed.

The first three pages are the State's form which was not used and the following sixteen pages are the form that Dominion utilized.

Fulton County Pennsylvania
Election Assessment

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pennsylvania
DEPARTMENT OF STATE

Voting System Implementation Attestation

System Name: _____

County: _____

Date Installed/Upgraded: _____

The below hardware/software was installed and verified on the system implemented:

System Component	Software or Firmware Version	Hardware Version	Model	Comments (Please specify the implementation details, maybe define Client/Server as applicable
EMS Election Event Designer (EED)	5.5.12.1			
EMS Results Tally and Reporting (RTR)	5.5.12.1			
EMS Application Server	5.5.12.1			
EMS File System Service (FSS)	5.5.12.1			
EMS Audio Studio (AS)	5.5.12.1			
EMS Data Center Manager (DCM)	5.5.12.1			
EMS Election Data Translator (EDT)	5.5.12.1			
ImageCast Voter Activation (ICVA)	5.5.12.1			
EMS Adjudication	5.5.8.1			

Page | 1

Fulton County Pennsylvania
Election Assessment

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EMS Adjudication Service	5.5.8.1			
Smart Card Helper Service	5.5.12.1			
ImageCast Precinct	5.5.3-0002			
ImageCast Central	5.5.3.0002			
ImageCast X	5.5.30			

Further to the key hardware/software components listed above, any of the COTS software and

Page | 2

Fulton County Pennsylvania
Election Assessment

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ancillary components like switches, ballot boxes, charging carts sold on this contract are EAC certified components of the Dominion Democracy Suite 5.5A electronic voting system. (Attach a list of items sold on this contract.)

Dominion has validated that the systems have been installed and hardened following the EAC certified system hardening instructions and no software other than the voting system software has been installed on any of the components.

Vendor Representative Signature: _____

Vendor Representative Name: _____   **Title:** _____

Telephone: _____   **Email:** _____

County Representative Signature: _____

County Representative Name: _____   **Title:** _____

Page | 3

Fulton County Pennsylvania
Election Assessment

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Step	Stage	Details	Pass	Fail	Comments / Issues
	DOMINION VOTING ImageCast Serial Number: 190 6 170338 PH85F 55877	**ImageCast X Classic Series Acceptance Test Checklist - Receiving** IFWI Version (BIOS): BCX18 BIOS V201 Firmware Version (Build Number): BCX18 V0.0.98			
		Inspection Stage			
1	Inspection	Ensure that there is no physical damage to the touch screen, and tablet	√		
2		Ensure the Smart Card reader is securely intact. Plug the BMD laser printer into the ICX unit. Plug in an AB to the ICX unit.	√		
		Power Up and System Status Verification (with Test Election USB Sticks)			
3		Insert Test Election & ICX application copied on a USB Memory Stick into the top USB slot.	√		
4	System Power Up	Connect the power cord to the tablet and turn on the unit. Press on "Settings" -> "About Tablet".	√		
5		Write & confirm the IFWI Version (BIOS) here: S.J.1 Apr 6	√		
		Write & confirm the Build Number (Firmware) here: S.S. 10.30	√		
6	Date and Time	Press on "Settings -> "Date & Time" and verify correct *local* date and time is displayed. Adjust if necessary.	√		
7	Installation of Application	Press "OI File Manager" on the main screen and proceed to install the ICX application.	√		
		Functional Testing			
8		Press "ImageCast X" and insert a Technician card into the Smart Card Reader	√		
9	Test Election Application	At the top click on "Load Settings". Select the election data and then click on "copy"	√		
10		Insert a poll worker card and select the BMD tabulator under the "Select Tabulator" pull down menu	√		
11		Ensure the "Public Counter" is zero.	√		
12		Open the Poll	√		
13		User should be transferred to Login Voter Screen	√		
14		Check the top right corner that there is a charging symbol for the power.	√		
15	Battery Status Verification	Unplug the power cord from the ICX. The ICX should stay on and the charging symbol should disappear.	√		
16		Replug the power cord back into the ICX. The charging symbol should reappear	√		
17		Insert a Voter Card and begin the standard voting session and complete the session by printing off the ballot Inspect the printed ballot and compare with desired votes	√		
18	Test Election Results Verification	Insert a Poll Worker Card Enable AVS Controller and then remove the Poll Worker Card Insert a Voter Card and begin the AVS voting session Inspect the printed ballot and compare with desired votes	√		
19		Insert a Poll Worker Card and Close the Polls	√		
20	Re-Zero Results	From Poll Worker Menu, select "**Re-Zero**". To Re-Zero the results, enter the password provided.	√		
21		Power down the ICX through the Poll Worker Menu using the "Power Down" button.	√		
22	Power Down & Signatures	Once the ICX is completely powered down, remove the USB Memory Stick from the ICX	√		
23		Sign and date this completed checklist.	√		

Dominion Voting Systems Rep Name and Initials: *Jac Pana*   Date: 8/28/19

Fulton County Pennsylvania
Election Assessment

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ARCHITECTING IT FOR THE FUTURE

OFFICIAL BALLOT
General Election
Tuesday, November 3, 2020
Anywhere County

Precinct 1

FAVORITE PAST PRESIDENT
  Vote for George Washington/John
    Adams (Fed)

FAVORITE SPORTS TEAM
  UNDER_VOTE_BY 2
  Vote for Philadelphia Eagles

ALL-TIME FAVORITE TALK SHOW
  Vote for Johnny Carson

FAVORITE AUTHOR
  Vote for Carl Sanburg

FAVORITE MUSICIAN
  Vote for Kid Rock

FAVORITE ARTIST
  Vote for Leonardo da Vinci

FAVORITE COLLEGE OR UNIVERSITY
  Vote for Michigan State

STATE GASOLINE TAX
  Vote for Yes

COUNTY PARK COMMISSION PROPOSAL
  Vote for Yes

1/1

19 February 2021

Fulton County Pennsylvania
Election Assessment

WAKETSI

ImageCast X Classic Series Acceptance Test Checklist - Receiving					

DOMINION VOTING

PHB5F55863

ImageCast Serial Number: 1906170518

IFWI Version (BIOS): ICX18 BIOS V201

Firmware Version (Build Number): ICX18 V0.0.98

Step	Stage	Details	Pass	Fail	Comments / Issues
		Inspection Stage			
1		Ensure that there is no physical damage to the touch screen, and tablet	✓		
2	Inspection	Ensure the Smart Card reader is securely intact. Plug the BMD laser printer to the ICX unit. Plug in an ATI to the ICX unit.	✓		
		Power Up and System Status Verification (with Test Election USB Sticks)			
3		Insert Test Election & ICX application copied on a USB Memory Stick into the top USB slot.	✓		
4	System Power Up	Connect the power cord to the tablet and turn on the unit. Press on "Settings" -> "About Tablet".	✓		
5		Write & confirm the IFWI Version (BIOS) here. __5.1.1,APr6,__	✓		
5		Write & confirm the Build Number (Firmware) here: __5.5.10.30__	✓		
6	Date and Time	Press on "Settings > "Date & Time" and verify correct **local** date and time is displayed. Adjust it necessary.	✓		
7	Installation of Application	Press "O: File Manager" on the main screen and proceed to install the ICX application.	✓		
		Functional Testing			
8		Press "ImageCast X" and insert a Technician card into the Smart Card Reader	✓		
9		At the top click on "Load Settings", Select the election data and then click on "copy"	✓		
10	Test Election Application	Insert a poll worker card and select the BMD tabulator under the "Select Tabulator" pull down menu	✓		
11		Ensure the "Public Counter" is zero.	✓		
12		Open the Poll	✓		
13		User should be transferred to Login Voter Screen	✓		
14		Check the top right corner that there is a charging symbol for the power.	✓		
15	Battery Status Verification	Unplug the power cord from the ICX. The ICX should stay on and the charging symbol should disappear.	✓		
16		Replug the power cord back into the ICX. The charging symbol should reappear	✓		
17		Insert a Voter Card and begin the standard voting session and complete the session by printing off the ballot. Inspect the printed ballot and compare with desired votes	✓		
18	Test Election Results Verification	Insert a Poll Worker Card. Enable AVS Controller and then remove the Poll worker Card. Insert a Voter Card and begin the AVS voting session. Inspect the printed ballot and compare with desired votes	✓		
19		Insert a Poll Worker Card and Close the Polls	✓		
20	Re-Zero Results	From Poll Worker Menu, select "**Re-Zero**". To Re-Zero the results, enter the password provided.	✓		
21		Power down the ICX through the Poll Worker Menu using the "**Power Down**" button.	✓		
22	Power Down & Signatures	Once the ICX is completely powered down, remove the USB Memory Stick from the ICX	✓		
23		Sign and date this completed checklist.	✓		

Dominion Voting Systems Rep Name and Initials. _Joc Derr_ Date: _08/28/19_

Fulton County Pennsylvania
Election Assessment

WAKETSI

Step	Stage	Details	Pass	Fail	Comments / Issues

DOMINION VOTING

PHB5F 55857

ImageCast Serial Number: 190b170339

ImageCast X Classic Series Acceptance Test Checklist - Receiving

IFWI Version (BIOS): BCX18 BIOS V201

Firmware Version (Build Number): BCX18 V0.0.98

Step	Stage	Details	Pass	Fail	Comments / Issues
		Inspection Stage			
1	Inspection	Ensure that there is no physical damage to the touch screen, and tablet	✓		
2		Ensure the Smart Card reader is securely intact. Plug the BMD laser printer to the ICX unit. Plug in an ATI to the ICX unit.	✓		
		Power Up and System Status Verification (with Test Election USB Sticks)			
3	System Power Up	Insert Test Election & ICX application copied on a USB Memory Stick into the top USB slot.	✓		
4		Connect the power cord to the tablet and turn on the unit. Press on "Settings" -> "About Tablet".	✓		
5		Write & confirm the IFWI Version (BIOS) here: 5.1.1 April6	✓		
		Write & confirm the Build Number (Firmware) here: 5.5.10.30	✓		
6	Date and Time	Press on "Settings -> " Date & Time" and verify correct local date and time is displayed. Adjust if necessary	✓		
7	Installation of Application	Press "OI File Manager" on the main screen and proceed to install the ICX application.	✓		
		Functional Testing			
8	Test Election Application	Press "ImageCast X" and insert a Technician card into the Smart Card Reader	✓		
9		At the top click on "Load Settings" Select the election data and then click on "copy"	✓		
10		Insert a poll worker card and select the BMD tabulator under the "Select Tabulator" pull down menu	✓		
11		Ensure the "Public Counter" is zero.	✓		
12		Open the Poll	✓		
13		User should be transferred to Login Voter Screen	✓		
14	Battery Status Verification	Check the top right corner that there is a charging symbol for the power.	✓		
15		Unplug the power cord from the ICX. The ICX should stay on and the charging symbol should disappear.	✓		
16		Replug the power cord back into the ICX. The charging symbol should reappear	✓		
17	Test Election Results Verification	Insert a Voter Card and begin the standard voting session and complete the session by printing off the ballot Inspect the printed ballot and compare with desired votes	✓		
18		Insert a Poll Worker Card Enable AVS Controller and then remove the Poll Worker Card Insert a Voter Card and begin the AVS voting session Inspect the printed ballot and compare with desired votes	✓		
19		Insert a Poll Worker Card and Close the Polls	✓		
20	Re-Zero Results	From Poll Worker Menu, select "Re-Zero". To Re-Zero the results, enter the password provided.	✓		
21	Power Down & Signatures	Power down the ICX through the Poll Worker Menu using the "Power Down" button.	✓		
22		Once the ICX is completely powered down, remove the USB Memory Stick from the ICX	✓		
23		Sign and date this completed checklist.	✓		

Dominion Voting Systems Rep Name and Initials: Joe Demm   Date: 8/28/19

Fulton County Pennsylvania
Election Assessment

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		ImageCast® X Classic Series Acceptance Test Checklist - Receiving			
DOMINION VOTING		PHB5F55873		IFWI Version (BIOS): BCX18 BIOS V201	
ImageCast Serial Number: 1906170875				Firmware Version (Build Number): BCX18 V0.0.95	
Step	**Stage**	**Details**	**Pass**	**Fail**	**Comments / Issues**
		Inspection Stage			
1	Inspection	Ensure that there is no physical damage to the touch screen, and tablet	√		
2		Ensure the Smart Card reader is securely intact, Plug the BMD laser printer to the ICX unit, Plug in an ATI to the ICX unit.	√		
		Power Up and System Status Verification (with Test Election USB Sticks)			
3		Insert Test Election & ICX application copied on a USB Memory Stick into the top USB slot.	√		
4	System Power Up	Connect the power cord to the tablet and turn on the unit. Press on "Settings" -> "About Tablet".	√		
		Write & confirm the IFWI Version (BIOS) here: _BIOS 5.3.1 APr6_	√		
5		Write & confirm the Build Number (Firmware) here: _5.5.10.30_	√		
6	Date and Time	Press on "Settings -> " Date & Time" and verify correct **local** date and time is displayed. Adjust if necessary	√		
7	Installation of Application	Press "OI File Manager" on the main screen and proceed to install the ICX application.	√		
		Functional Testing			
8		Press "ImageCast X" and insert a Technician card into the Smart Card Reader	√		
9		At the top click on "Load Settings". Select the election data and then click on "copy"	√		
10	Test Election Application	Insert a poll worker card and select the BMD tabulator under the "Select Tabulator" pull down menu	√		
11		Ensure the "Public Counter" is zero.	√		
12		Open the Poll	√		
13		User should be transferred to Login Voter Screen	√		
14		Check the top right corner that there is a charging symbol for the power.	√		
15	Battery Status Verification	Unplug the power cord from the ICX. The ICX should stay on and the charging symbol should disappear.	√		
16		Replug the power cord back into the ICX. The charging symbol should reappear	√		
17		Insert a Voter Card and begin the standard voting session and complete the session by printing off the ballot	√		
		Inspect the printed ballot and compare with desired votes	√		
	Test Election Results Verification	Insert a Poll Worker Card			
18		Enable AVS Controller and then remove the Poll Worker Card	√		
		Insert a Voter Card and begin the AVS voting session	√		
		Inspect the printed ballot and compare with desired votes	√		
19		Insert a Poll Worker Card and Close the Polls	√		
20	Re-Zero Results	From Poll Worker Menu, select "Re-Zero", To Re-Zero the results, enter the password provided.	√		
21		Power down the ICX through the Poll Worker Menu using the **'Power Down'** button.	√		
22	Power Down & Signatures	Once the ICX is completely powered down, remove the USB Memory Stick from the ICX	√		
23		Sign and date this completed checklist.	√		

Dominion Voting Systems Rep Name and Initials: _Joe Lam_   Date: _8/28/19_

Fulton County Pennsylvania
Election Assessment

WAKETSI

		ImageCast® X Classic Series Acceptance Test Checklist - Receiving		
DOMINION VOTING		PHB 5F55 859	IFWI Version (BIOS): 8CX18 BIOS V201	
ImageCast Serial Number:		1906170778	Firmware Version (Build Number): 8CX18 V0.0.98	

Step	Stage	Details	Pass/Fail	Comments / Issues
		Inspection Stage		
1	Inspection	Ensure that there is no physical damage to the touch screen, and tablet	✓	
2		Ensure the Smart Card reader is securely intact. Plug the BMD laser printer to the ICX unit. Plug in an ATI to the ICX unit.	✓	
		Power Up and System Status Verification (with Test Election USB Sticks)		
3		Insert Test Election & ICX application copied on a USB Memory Stick into the top USB slot.	✓	
4	System Power Up	Connect the power cord to the tablet and turn on the unit. Press on "Settings" -> "About Tablet".	✓	
5		Write & confirm the IFWI Version (BIOS) here: __S.I.I. APC6__	✓	
		Write & confirm the Build Number (Firmware) here: __S.S 10.50__	✓	
6	Date and Time	Press on "Settings -> " Date & Time" and verify correct local date and time is displayed. Adjust if necessary.	✓	
7	Installation of Application	Press "On File Manager" on the main screen and proceed to install the ICX application.	✓	
		Functional Testing		
8		Press "ImageCast X" and insert a technician card into the Smart Card Reader	✓	
9		At the top click on "Load Settings". Select the election data and then click on "copy".	✓	
10	Test Election Application	Insert a poll worker card and select the BMD tabulator under the "Select Tabulator" pull down menu	✓	
11		Ensure the "Public Counter" is zero.	✓	
12		Open the Poll	✓	
13		User should be transferred to Login Voter Screen	✓	
14		Check the top right corner that there is a charging symbol for the power.	✓	
15	Battery Status Verification	Unplug the power cord from the ICX. The ICX should stay on and the charging symbol should disappear.	✓	
16		Replug the power cord back into the ICX. The charging symbol should reappear	✓	
17		Insert a Voter Card and begin the standard voting session and complete the session by printing off the ballot	✓	
	Test Election Results Verification	Inspect the printed ballot and compare with desired votes		
18		Insert a Poll Worker Card	✓	
		Enable AVS Controller and then remove the Poll Worker Card		
		Insert a Voter Card and begin the AVS voting session		
		Inspect the printed ballot and compare with desired votes	✓	
19		Insert a Poll Worker Card and Close the Polls	✓	
20	Re-Zero Results	From Poll Worker Menu, select "Re-Zero". To Re-Zero the results, enter the password provided.	✓	
21		Power down the ICX through the Poll Worker Menu using the 'Power Down' button.	✓	
22	Power Down & Signatures	Once the ICX is completely powered down, remove the USB Memory Stick from the ICX	✓	
23		Sign and date this completed checklist.	✓	

Dominion Voting Systems Rep Name and Initials: _Joe Jann_   Date __8/28/19__

Fulton County Pennsylvania
Election Assessment

WAKETSI

		ImageCast® X Classic Series Acceptance Test Checklist - Receiving			
DOMINION VOTING		P#B6765037		IFWI Version (BIOS): 8CX18 BIOS V201	
		190670880			
ImageCast Serial Number:				Firmware Version (Build Number): 8CX18 V0.0.98	
Step	Stage	Details	Pass	Fail	Comments / Issues
		Inspection Stage			
	Inspection	Ensure that there is no physical damage to the touch screen, and tablet	✓		
2		Ensure the Smart Card reader is securely intact. Plug the BMD laser printer to the ICX unit. Plug in an AP to the ICX unit.	✓		
		Power Up and System Status Verification (with Test Election USB Sticks)			
3		Insert Test Election & ICX application copied on a USB Memory Stick into the top USB slot.	✓		
4	System Power Up	Connect the power cord to the tablet and turn on the unit. Press on "Settings" -> "About Tablet".	✓		
5		Write & confirm the IFWI version (BIOS) here: *Fri APRIL 6, 20**	✓		
		Write & confirm the Build Number (Firmware) here: 5.5.10.30	✓		
6	Date and Time	Press on "Settings -> 'Date & Time" and verify correct local date and time is displayed. Adjust it necessary.	✓		
7	Installation of Application	Press "OI File Manager" on the main screen and proceed to install the ICX application.			
		Functional Testing			
8		Press "ImageCast X" and insert a Technician card into the Smart Card Reader	✓		
9		At the top click on "Load Settings". Select the election data and then click on "copy"	✓		
10	Test Election Application	Insert a poll worker card and select the BMD tabulator under the "Select Tabulator" pull down menu	✓		
11		Ensure the "Public Counter" is zero.	✓		
12		Open the Poll	✓		
13		User should be transferred to Login Voter Screen	✓		
14		Check the top right corner that there is a charging symbol for the power.	✓		
15	Battery Status Verification	Unplug the power cord from the ICX. The ICX should stay on and the charging symbol should disappear.	✓		
16		Replug the power cord back into the ICX. The charging symbol should reappear	✓		
17		Insert a Voter Card and begin the standard voting session and complete the session by printing off the ballot. Inspect the printed ballot and compare with desired votes	✓		
18	Test Election Results Verification	Insert a Poll Worker Card. Enable AVS Controller and then remove the Poll Worker Card. Insert a Voter Card and begin the AVS voting session. Inspect the printed ballot and compare with desired votes	✓		
19		Insert a Poll Worker Card and Close the Polls	✓		
20	Re-Zero Results	From Poll Worker Menu, select "Re-Zero". To Re-Zero the results, enter the password provided.	✓		
21		Power down the ICX through the Poll Worker Menu using the 'Power Down' button.	✓		
22	Power Down & Signatures	Once the ICX is completely powered down, remove the USB Memory Stick from the ICX	✓		
23		Sign and date this completed checklist.	✓		

Dominion Voting Systems Rep Name and Initials: JUAN SERVATI   Date: 8/28/2019

Fulton County Pennsylvania
Election Assessment

WAKETSI

DOMINION VOTING

ImageCast Serial Number: PHB5F55860
1906170879

ImageCast X Classic Series Acceptance Test Checklist - Receiving

IFWI Version (BIOS): 8CX18 8IOS V201

Firmware Version (Build Number): 8CX18 V0.0.98

Step	Stage	Details	Pass	Fail	Comments / Issues
		Inspection Stage			
2	Inspection	Ensure that there is no physical damage to the touch screen, and tablet	✓		
		Ensure the Smart Card reader is securely intact. Plug the BMD laser printer to the ICX unit. Plug in an ATI to the ICX unit.	✓		
		Power Up and System Status Verification (with Test Election USB Sticks)			
3	System Power Up	Insert Test Election & ICX application copied on a USB Memory Stick into the top USB slot.	✓		
4		Connect the power cord to the tablet and turn on the unit. Press on "Settings" -> "About Tablet".	✓		
5		Write & confirm the IFWI Version (BIOS) here: 5.1.1 APr,6,	✓		
		Write & confirm the Build Number (Firmware) here: 5.5.10.30	✓		
6	Date and Time	Press on "Settings -> "Date & Time" and verify correct local date and time is displayed. Adjust if necessary.	✓		
7	Installation of Application	Press "OI File Manager" on the main screen and proceed to install the ICX application.	✓		
		Functional Testing			
8		Press "ImageCast X" and insert a Technician card into the Smart Card Reader	✓		
9	Test Election Application	At the top click on "Load Settings". Select the election data and then click on "copy"	✓		
10		Insert a poll worker card and select the BMD tabulator under the "Select Tabulator" pull down menu	✓		
11		Ensure the "Public Counter" is zero.	✓		
12		Open the Poll	✓		
13		User should be transferred to Login Voter Screen	✓		
14		Check the top right corner that there is a charging symbol for the power.	✓		
15	Battery Status Verification	Unplug the power cord from the ICX. The ICX should stay on and the charging symbol should disappear.	✓		
16		Replug the power cord back into the ICX. The charging symbol should reappear	✓		
17		Insert a Voter Card and begin the standard voting session and complete the session by printing off the ballot	✓		
	Test Election Results Verification	Inspect the printed ballot and compare with desired votes	✓		
18		Insert a Poll Worker Card			
		Enable AVS Controller and then remove the Poll Worker Card	✓		
		Insert a Voter Card and begin the AVS voting session			
19		Inspect the printed ballot and compare with desired votes	✓		
		Insert a Poll Worker Card and Close the Polls			
20	Re-Zero Results	From Poll Worker Menu, select "Re-Zero". To Re-Zero the results, enter the password provided.	✓		
21		Power down the ICX through the Poll Worker Menu using the "Power Down" button.	✓		
22	Power Down & Signatures	Once the ICX is completely powered down, remove the USB Memory Stick from the ICX	✓		
23		Sign and date this completed checklist	✓		

Dominion Voting Systems Rep Name and Initials: _Joe Vance_

Date: 8/28/19

Fulton County Pennsylvania
Election Assessment

WAKETSI

		ImageCast® X Classic Series Acceptance Test Checklist - Receiving
DOMINION VOTING PHBSF5876		IFWI Version (BIOS): ICX18 BIOS V201
ImageCast Serial Number: 1906170876		Firmware Version (Build Number): ICX18 V0.0.98

Step	Stage	Details	Pass	Fail	Comments / Issues
		Inspection Stage			
	Inspection	Ensure that there is no physical damage to the touch screen, and tablet	✓		
2		Ensure the Smart Card reader is securely intact. Plug the BMD laser printer to the ICX unit. Plug in an ATI to the ICX unit.	✓		
		Power Up and System Status Verification (with Test Election USB Sticks)			
3		Insert Test Election & ICX application copied on a USB Memory Stick into the top USB slot.	✓		
4	System Power Up	Connect the power cord to the tablet and turn on the unit. Press on "Settings" -> "About Tablet".	✓		
5		Write & confirm the IFWI Version (BIOS) here: 6.1.1 RDr 6,	✓		
		Write & confirm the Build Number (Firmware) here: 5.5.10.30	✓		
6	Date and Time	Press on 'Settings -> " Date & Time' and verify correct local date and time is displayed. Adjust if necessary.	✓		
7	Installation of Application	Press "OI File Manager" on the main screen and proceed to install the ICX application.	✓		
		Functional Testing			
8		Press "ImageCast X" and insert a Technician card into the Smart Card Reader	✓		
9		At the top click on "Load Settings". Select the election data and then click on "copy"	✓		
10	Test Election Application	Insert a poll worker card and select the BMD tabulator under the "Select Tabulator" pull down menu	✓		
11		Ensure the "Public Counter" is zero.	✓		
12		Open the Poll	✓		
13		User should be transferred to Login Voter Screen	✓		
14		Check the top right corner that there is a charging symbol for the power.	✓		
15	Battery Status Verification	Unplug the power cord from the ICX. The ICX should stay on and the charging symbol should disappear.	✓		
16		Replug the power cord back into the ICX. The charging symbol should reappear	✓		
17		Insert a Voter Card and begin the standard voting session and complete the session by printing off the ballot	✓		
	Test Election Results Verification	Inspect the printed ballot and compare with desired votes Insert a Poll Worker Card Enable AVS Controller and then remove the Poll Worker Card Insert a Voter Card and begin the AVS voting session			
18			✓		
		Inspect the printed ballot and compare with desired votes			
19		Insert a Poll Worker Card and Close the Polls	✓		
20	Re-Zero Results	From Poll Worker Menu, select "Re-Zero". To Re-Zero the results, enter the password provided.	✓		
21		Power down the ICX through the Poll Worker Menu using the "Power Down" button.	✓		
22	Power Down & Signatures	Once the ICX is completely powered down, remove the USB Memory Stick from the ICX	✓		
23		Sign and date this completed checklist.			

Dominion Voting Systems Rep Name and Initials: Joe Sam   Date: 08/28/19

Fulton County Pennsylvania
Election Assessment

WAKETSI

		ImageCast® X Classic Series Acceptance Test Checklist - Receiving

DOMINION VOTING

PHB SFS 5 870

ImageCast Serial Number: 1906 170873

IFWI Version (BIOS): BCX18 BIOS V201

Firmware Version (Build Number): BCX18 V0.0.98

Step	Stage	Details	Pass	Fail	Comments / Issues
		Inspection Stage			
1	Inspection	Ensure that there is no physical damage to the touch screen, and tablet	✓		
2		Ensure the Smart Card reader is securely intact. Plug the BMD laser printer to the ICX unit. Plug in an ATI to the ICX unit.	✓		
		Power Up and System Status Verification (with Test Election USB Sticks)			
3		Insert Test Election & ICX application copied on a USB Memory Stick into the top USB slot.	✓		
4	System Power Up	Connect the power cord to the tablet and turn on the unit. Press on "Settings" -> "About Tablet".	✓		
5		Write & confirm the IFWI Version (BIOS) here: 5.1.1 Rev 6	✓		
		Write & confirm the Build Number (Firmware) here: 5.5.10.30	✓		
6	Date and Time	Press on "Settings" > "Date & Time" and verify correct local date and time is displayed. Adjust if necessary.	✓		
7	Installation of Application	Press "OI File Manager" on the main screen and proceed to install the ICX application.	✓		
		Functional Testing			
8		Press "ImageCast X" and insert a Technician card into the Smart Card Reader	✓		
9	Test Election Application	At the top click on "Load Settings". Select the election data and then click on "copy"	✓		
10		Insert a poll worker card and select the BMD tabulator under the "Select Tabulator" pull down menu	✓		
11		Ensure the "Public Counter" is zero.	✓		
12		Open the Poll	✓		
13		User should be transferred to Login Voter Screen	✓		
14		Check the top right corner that there is a charging symbol for the power.	✓		
15	Battery Status Verification	Unplug the power cord from the ICX. The ICX should stay on and the charging symbol should disappear.	✓		
16		Replug the power cord back into the ICX. The charging symbol should reappear	✓		
17		Insert a Voter Card and begin the standard voting session and complete the session by printing off the ballot. Inspect the printed ballot and compare with desired votes	✓		
18	Test Election Results Verification	Insert a Poll Worker Card. Enable AVS Controller and then remove the Poll Worker Card. Insert a Voter Card and begin the AVS voting session. Inspect the printed ballot and compare with desired votes	✓		
19		Insert a Poll Worker Card and Close the Polls	✓		
20	Re-Zero Results	From Poll Worker Menu, select "Re-Zero". To Re-Zero the results, enter the password provided.	✓		
21		Power down the ICX through the Poll Worker Menu using the "Power Down" button.	✓		
22	Power Down & Signatures	Once the ICX is completely powered down, remove the USB Memory Stick from the ICX	✓		
23		Sign and date this completed checklist	✓		

Dominion Voting Systems Rep Name and Initials: Joe dam

Date: 8/28/19

Fulton County Pennsylvania
Election Assessment

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			ImageCast X Classic Series Acceptance Test Checklist - Receiving			
DOMINION VOTING						
		PUR5F55 871		IFWI Version (BIOS): BCX18 BIOS V2Q1		
ImageCast Serial Number:		1906110716		Firmware Version (Build Number): BCX18 V0.0.98		
Step	**Stage**	**Details**		**Pass**	**Fail**	**Comments / Issues**
		Inspection Stage				
1	Inspection	Ensure that there is no physical damage to the touch screen, and tablet		✓		
2		Ensure the Smart Card reader is securely intact. Plug the BMD laser printer to the ICX unit. Plug in an ATI to the ICX unit.		✓		
		Power Up and System Status Verification (with Test Election USB Sticks)				
3		Insert Test Election & ICX application copied on a USB Memory Stick into the top USB slot.		✓		
4	System Power Up	Connect the power cord to the tablet and turn on the unit. Press on "Settings" -> "About Tablet".		✓		
5		Write & confirm the IFWI Version (BIOS) here: S.1.1 Rev 61		✓		
		Write & confirm the Build Number (Firmware) here: S.5.10.50		✓		
6	Date and Time	Press on "Settings -> " Date & Time" and verify correct local date and time is displayed. Adjust if necessary.		✓		
7	Installation of Application	Press "OI File Manager" on the main screen and proceed to install the ICX application.		✓		
		Functional Testing				
8		Press "ImageCast X" and insert a Technician card into the Smart Card Reader		✓		
9	Test Election Application	At the top click on "Load Settings". Select the election data and then click on "copy"		✓		
10		Insert a poll worker card and select the BMD tabulator under the "Select Tabulator" pull down menu		✓		
11		Ensure the "Public Counter" is zero.		✓		
12		Open the Poll		✓		
13		User should be transferred to Login Voter Screen		✓		
14		Check the top right corner that there is a charging symbol for the power.		✓		
15	Battery Status Verification	Unplug the power cord from the ICX. The ICX should stay on and the charging symbol should disappear.		✓		
16		Replug the power cord back into the ICX. The charging symbol should reappear		✓		
17		Insert a Voter Card and begin the standard voting session and complete the session by printing off the ballot. Inspect the printed ballot and compare with desired votes		✓		
18	Test Election Results Verification	Insert a Poll Worker Card. Enable AVS Controller and then remove the Poll Worker Card. Insert a Voter Card and begin the AVS voting session. Inspect the printed ballot and compare with desired votes		✓		
19		Insert a Poll Worker Card and Close the Polls		✓		
20	Re-Zero Results	From Poll Worker Menu, select "Re-Zero". To Re-Zero the results, enter the password provided.		✓		
21		Power down the ICX through the Poll Worker Menu using the 'Power Down' button.		✓		
22	Power Down & Signatures	Once the ICX is completely powered down, remove the USB Memory Stick from the ICX		✓		
23		Sign and date this completed checklist.		✓		

Dominion Voting Systems Rep Name and Initials: _Joe Lam_   Date: 08/28/19

Fulton County Pennsylvania
Election Assessment

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		ImageCast® X Classic Series Acceptance Test Checklist - Receiving		
DOMINION VOTING				
	PH85F5586-2		IFWI Version (BIOS): SCX18 BIOS V201	
ImageCast Serial Number: 1906170874			Firmware Version (Build Number): SCX18 V0.0.98	

Step	Stage	Details	Pass	Fail	Comments / Issues
		Inspection Stage			
1	Inspection	Ensure that there is no physical damage to the touch screen, and tablet	✓		
2		Ensure the Smart Card reader is securely intact. Plug the BMD laser printer to the ICX unit. Plug in an ATI to the ICX unit.	✓		
		Power Up and System Status Verification (with Test Election USB Sticks)			
3		Insert Test Election & ICX application copied on a USB Memory Stick into the top USB slot.	✓		
4	System Power Up	Connect the power cord to the tablet and turn on the unit. Press on "Settings" -> "About Tablet".	✓		
5		Write & confirm the IFWI Version (BIOS) here: S.1.1 PPr6i	✓		
		Write & confirm the Build Number (Firmware) here: S.S.10.30	✓		
6	Date and Time	Press on "Settings -> " Date & Time" and verify correct local date and time is displayed. Adjust if necessary.	✓		
7	Installation of Application	Press "OI File Manager" on the main screen and proceed to install the ICX application.	✓		
		Functional Testing			
8		Press "ImageCast X" and insert a Technician card into the Smart Card Reader	✓		
9		At the top click on "Load Settings". Select the election data and then click on "copy"	✓		
10	Test Election Application	Insert a poll worker card and select the BMD tabulator under the "Select Tabulator" pull down menu	✓		
11		Ensure the "Public Counter" is zero.	✓		
12		Open the Poll	✓		
13		User should be transferred to Login Voter Screen	✓		
14		Check the top right corner that there is a charging symbol for the power.	✓		
15	Battery Status Verification	Unplug the power cord from the ICX. The ICX should stay on and the charging symbol should disappear.	✓		
16		Replug the power cord back into the ICX. The charging symbol should reappear	✓		
17		Insert a Voter Card and begin the standard voting session and complete the session by printing off the ballot. Inspect the printed ballot and compare with desired votes	✓		
18	Test Election Results Verification	Insert a Poll Worker Card. Enable AVS Controller and then remove the Poll Worker Card. Insert a Voter Card and begin the AVS voting session. Inspect the printed ballot and compare with desired votes	✓		
19		Insert a Poll Worker Card and Close the Polls	✓		
20	Re-Zero Results	From Poll Worker Menu, select "Re-Zero". To Re-Zero the results, enter the password provided.	✓		
21		Power down the ICX through the Poll Worker Menu using the 'Power Down' button.	✓		
22	Power Down & Signatures	Once the ICX is completely powered down, remove the USB Memory Stick from the ICX	✓		
23		Sign and date this completed checklist.	✓		

Dominion Voting Systems Rep Name and Initials: _JrC Bann_   Date: 08/28/19

Fulton County Pennsylvania
Election Assessment

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		ImageCast X Classic Series Acceptance Test Checklist - Receiving

DOMINION VOTING

PH85F558S8

ImageCast Serial Number: 1906 170717

IFWI Version (BIOS): BCX18 BIOS V201

Firmware Version (Build Number): BCX16 V0.0.98

Step	Stage	Details	Pass	Fail	Comments / Issues
		Inspection Stage			
1		Ensure that there is no physical damage to the touch screen, and tablet	√		
2	Inspection	Ensure the Smart Card reader is securely intact. Plug the BMD laser printer to the ICX unit. Plug in an ATI to the ICX unit.	√		
		Power Up and System Status Verification (with Test Election USB Sticks)			
3		Insert Test Election & ICX application copied on a USB Memory Stick into the top USB slot.	√		
4	System Power Up	Connect the power cord to the tablet and turn on the unit. Press on "Settings" -> "About Tablet".	√		
5		Write & confirm the IFWI version (BIOS) here: 5.1.1 BCX16	√		
		Write & confirm the Build Number (Firmware) here: 5.5 16.30	√		
6	Date and Time	Press on "Settings -> " Date & Time" and verify correct **local** date and time is displayed. Adjust if necessary.	√		
7	Installation of Application	Press "OI File Manager" on the main screen and proceed to install the ICX application	√		
		Functional Testing			
8		Press "ImageCast X" and insert a Technician card into the Smart Card Reader	√		
9		At the top click on "Load Settings". Select the election data and then click on "copy"	√		
10	Test Election Application	Insert a poll worker card and select the BMD tabulator under the "Select Tabulator" pull down menu	√		
11		Ensure the "Public Counter" is zero.	√		
12		Open the Poll	√		
13		User should be transferred to Login Voter Screen	√		
14		Check the top right corner that there is a charging symbol for the power.	√		
15	Battery Status Verification	Unplug the power cord from the ICX. The ICX should stay on and the charging symbol should disappear.	√		
16		Replug the power cord back into the ICX. The charging symbol should reappear	√		
17		Insert a Voter Card and begin the standard voting session and complete the session by printing off the ballot. Inspect the printed ballot and compare with desired votes	√		
18	Test Election Results Verification	Insert a Poll Worker Card. Enable AVS Controller and then remove the Poll Worker Card. Insert a Voter Card and begin the AVS voting session. Inspect the printed ballot and compare with desired votes	√		
19		Insert a Poll Worker Card and Close the Polls	√		
20	Re-Zero Results	From Poll Worker Menu, select "Re-Zero". To Re-Zero the results, enter the password provided.	√		
21		Power down the ICX through the Poll Worker Menu using the "Power Down" button.	√		
22	Power Down & Signatures	Once the ICX is completely powered down, remove the USB Memory Stick from the ICX	√		
23		Sign and date this completed checklist.	√		

Dominion Voting Systems Rep Name and Initials: Joe Oom

Date: 08/28/19

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Election Assessment

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DOMINION VOTING

PHB5F55856

ImageCast Serial Number: 19061708771

ImageCast X Classic Series Acceptance Test Checklist - Receiving

IFWI Version (BIOS): BCX18 BIOS V201

Firmware Version (Build Number): BCX18 V0.0.98

Step	Stage	Details	Pass	Fail	Comments / Issues
		Inspection Stage			
1	Inspection	Ensure that there is no physical damage to the touch screen, and table:	✓		
2		Ensure the Smart Card reader is securely intact. Plug the BMD laser printer to the ICX unit. Plug in an ATI to the ICX unit.	✓		
		Power Up and System Status Verification (with Test Election USB Sticks)			
3		Insert Test Election & ICX application copied on a USB Memory Stick into the top USB slot.	✓		
4	System Power Up	Connect the power cord to the tablet and turn on the unit. Press on "Settings" -> "About Tablet".	✓		
5		Write & confirm the IFWI Version (BIOS) here. 5.1.1 BPC6	✓		
		Write & confirm the Build Number (Firmware) here: S.S.10.30	✓		
6	Date and Time	Press on "Settings -> " Date & Time" and verify correct local date and time is displayed. Adjust if necessary.	✓		
7	Installation of Application	Press "OI File Manager" on the main screen and proceed to install the ICX application.	✓		
		Functional Testing			
8		Press "ImageCast X" and insert a Technician card into the Smart Card Reader	✓		
9	Test Election Application	At the top click on "Load Settings". Select the election data and then click on "copy"	✓		
10		Insert a poll worker card and select the BMD tabulator under the "Select Tabulator" pull down menu	✓		
11		Ensure the "Public Counter" is zero.	✓		
12		Open the Poll	✓		
13		User should be transferred to Login Voter Screen	✓		
14		Check the top right corner that there is a charging symbol for the power.	✓		
15	Battery Status Verification	Unplug the power cord from the ICX. The ICX should stay on and the charging symbol should disappear.	✓		
16		Replug the power cord back into the ICX. The charging symbol should reappear	✓		
17		Insert a Voter Card and begin the standard voting session and complete the session by printing off the ballot. Inspect the printed ballot and compare with desired votes	✓		
18	Test Election Results Verification	Insert a Poll Worker Card. Enable AVS Controller and then remove the Poll Worker Card. Insert a Voter Card and begin the AVS voting session. Inspect the printed ballot and compare with desired votes	✓		
19		Insert a Poll Worker Card and Close the Polls	✓		
20	Re-Zero Results	From Poll Worker Menu, select "Re-Zero". To Re-Zero the results. enter the password provided.	✓		
21		Power down the ICX through the Poll Worker Menu using the "Power Down" button.	✓		
22	Power Down & Signatures	Once the ICX is completely powered down, remove the USB Memory Stick from the ICX	✓		
23		Sign and date this completed checklist.	✓		

Dominion Voting Systems Rep Name and Initials: _JoC Jam_   Date: 08/28/19

Fulton County Pennsylvania
Election Assessment

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DOMINION VOTING

ImageCast® X Classic Series Acceptance Test Checklist - Receiving

PHBSF-55861

ImageCast Serial Number: 1906ПО 878

HWI Version (BIOS): BCX18 BIOS V201

Firmware Version (Build Number): BCX18 V0.0.98

Step	Stage	Details	Pass	Fail	Comments / Issues
		Inspection Stage			
.	Inspection	Ensure that there is no physical damage to the touch screen, and tablet	✓		
2		Ensure the Smart Card reader is securely intact. Plug the BMD laser printer to the ICX unit. Plug in an ATI to the ICX unit.	✓		
		Power Up and System Status Verification (with Test Election USB Sticks)			
3		Insert Test Election & ICX application copied on a USB Memory Stick into the top USB slot.	✓		
4	System Power Up	Connect the power cord to the tablet and turn on the unit. Press on "Settings" -> "About Tablet"	✓		
		Write & confirm the HWI Version (BIOS) here: 5.1.1 APr, 6,	✓		
5		Write & confirm the Build Number (firmware) here: S.S. 10.30	✓		
6	Date and Time	Press on "Settings -> " Date & Time" and verify correct local date and time is displayed. Adjust if necessary.	✓		
7	Installation of Application	Press "OI File Manager" on the main screen and proceed to install the ICX application.	✓		
		Functional Testing			
8		Press "ImageCast X" and insert a Technician card into the Smart Card Reader	✓		
9		At the top click on "Load Settings". Select the election data and then click on "copy"	✓		
10	Test Election Application	Insert a poll worker card and select the BMD tabulator under the "Select Tabulator" pull down menu	✓		
11		Ensure the "Public Counter" is zero.	✓		
12		Open the Poll	✓		
13		User should be transferred to Login Voter Screen	✓		
14		Check the top right corner that there is a charging symbol for the power.	✓		
15	Battery Status Verification	Unplug the power cord from the ICX. The ICX should stay on and the charging symbol should disappear.	✓		
16		Replug the power cord back into the ICX. The charging symbol should reappear	✓		
17		Insert a Voter Card and begin the standard voting session and complete the session by printing off the ballot. Inspect the printed ballot and compare with desired votes	✓		
18	Test Election Results Verification	Insert a Poll Worker Card. Enable AVS Controller and then remove the Poll Worker Card. Insert a Voter Card and begin the AVS voting session. Inspect the printed ballot and compare with desired votes	✓		
19		Insert a Poll Worker Card and Close the Polls	✓		
20	Re-Zero Results	From Poll Worker Menu, select "Re-Zero". To Re-Zero the results, enter the password provided.	✓		
21		Power down the ICX through the Poll Worker Menu using the 'Power Down' button.	✓		
22	Power Down & Signatures	Once the ICX is completely powered down, remove the USB Memory Stick from the ICX	✓		
23		Sign and date this completed checklist.	✓		

Dominion Voting Systems Rep Name and Initials: *Jac lan*

Date: 08/28/19

Fulton County Pennsylvania
Election Assessment

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ImageCast® X Classic Series Acceptance Test Checklist - Receiving

DOMINION VOTING

PHBSF55872

ImageCast Serial Number: 1906 ∩ 0509

IFWI Version (BIOS): BCX18 BIOS V201

Firmware Version (Build Number): BCX18 V0.0.98

Step	Stage	Details	Pass	Fail	Comments / Issues
		Inspection Stage	✓		
1	Inspection	Ensure that there is no physical damage to the touch screen, and tablet	✓		
2		Ensure the Smart Card reader is securely intact. Plug the BMD laser printer to the ICX unit. Plug in an ATI to the ICX unit.	✓		
		Power Up and System Status Verification (with Test Election USB Sticks)			
3		Insert Test Election & ICX application copied on a USB Memory Stick into the top USB slot.	✓		
4	System Power Up	Connect the power cord to the tablet and turn on the unit. Press on "Settings" -> "About Tablet".	✓		
5		Write & confirm the IFWI Version (BIOS) here: 5.1.1 A01.6	✓		
		Write & confirm the Build Number (Firmware) here: 5.5.10.30	✓		
6	Date and Time	Press on "Settings -> " Date & Time" and verify correct local date and time is displayed. Adjust if necessary.	✓		
7	Installation of Application	Press "OI File Manager" on the main screen and proceed to install the ICX application.	✓		
		Functional Testing			
8		Press "ImageCast X" and insert a Technician card into the Smart Card Reader	✓		
9		At the top click on "Load Settings". Select the election data and then click on "copy"	✓		
10	Test Election Application	Insert a poll worker card and select the BMD tabulator under the "Select Tabulator" pull down menu	✓		
11		Ensure the "Public Counter" is zero.	✓		
12		Open the Poll	✓		
13		User should be transferred to Login Voter Screen	✓		
14		Check the top right corner that there is a charging symbol for the power.	✓		
15	Battery Status Verification	Unplug the power cord from the ICX. The ICX should stay on and the charging symbol should disappear.	✓		
16		Replug the power cord back into the ICX. The charging symbol should reappear	✓		
17		Insert a Voter Card and begin the standard voting session and complete the session by printing off the ballot Inspect the printed ballot and compare with desired votes	✓		
18	Test Election Results Verification	Insert a Poll Worker Card Enable AVS Controller and then remove the Poll Worker Card Insert a Voter Card and begin the AVS voting session Inspect the printed ballot and compare with desired votes	✓		
19		Insert a Poll Worker Card and Close the Polls	✓		
20	Re-Zero Results	From Poll Worker Menu, select "Re-Zero". To Re-Zero the results, enter the password provided.	✓		
21		Power down the ICX through the Poll Worker Menu using the 'Power Down' button.	✓		
22	Power Down & Signatures	Once the ICX is completely powered down, remove the USB Memory Stick from the ICX	✓		
23		Sign and date this completed checklist.	✓		

Dominion Voting Systems Rep Name and Initials: Joc lam

Date: 08/28/19

Fulton County Pennsylvania
Election Assessment

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19 Appendix H - Pennsylvania Election Record Retention Rules

The following information is from the Pennsylvania "County Records Manual" which was issued for the County Records Committee by the Pennsylvania Historical and Museum Commission Bureau of the State Archives Harrisburg 2002 Edition. Updated as of March 2017.

ELECTION RECORDS

ADDITIONAL RETENTION REQUIREMENTS

Currently, Federal election records (including all records and papers pertaining to any application, registration or other act requisite to voting) must be retained 22 months from the date of any general, special, or primary election for federal office under the Civil Rights Act of 1960, codified at Title 42, U.S. Code, Sections 1974 through 1974e inclusive.

EL-1 Absentee Ballot Records

Includes absentee ballots and all related lists, applications, envelopes and files pertaining thereto. Application usually shows personal identification information, reason for request, and elector's signature.

Retain 2 years. (25 P.S. § 3146.9)

EL-2 Ballot Box Documents - Miscellaneous

Consists of all official ballots, the contents of ballot boxes, tally papers, numbered list of voters and election officers' oaths placed in ballot box at polling place. (See also EL-24.)

Retain 4 months, unless notified of extension of retention by the county's District Attorney or a judge of a court of record, due to pending prosecution or litigation. (25 P.S. §§ 2649 and 3065(a)). For one year, the minority inspector is required to retain one set of tally papers, one voter list, and one set of election-officer-oaths. (25 P.S. § 3065(b)).

EL-3 Ballot Preparation Workpapers And Candidate Lists

Includes papers and lists of local candidates' names used to design ballot layout at the county level, based upon ballot position lottery for the primary election, and the primary election results and substitute nominations for the November election.

Retain 11 months. (25 P.S. § 2649).

Fulton County Pennsylvania
Election Assessment

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EL-4 Campaign Expense Reports And Statements Filed By Candidates And Political Committees

Expense report shows name and address of candidate, committee, individual or lobbyist; office sought; summary of receipts and expenditures; signature of person swearing to accuracy of report; summary of contributions and receipts; itemized lists of contributions, receipts and expenditures; unpaid debts and obligations; and in-kind contributions. Statement includes name and address of candidate, committee or lobbyist; office sought; and certification of compliance with the Election Code.

Retain 5 years from date of filing. (25 P.S. § 3259(4)).

EL-5 Candidate Withdrawal Notices

Notification from candidates of their desire to withdraw from an election. Includes date, office, party, election date and candidate's signature.

Retain 11 months (Counties). (25 P.S. §§ 2649 and 2938).

EL-6 Candidates' Affidavits

Includes candidate's name and address, office sought, affidavit of eligibility, loyalty oath and ethics affidavit. May be part of nomination petition or separate form filed with petition.

Retain 11 months (Counties). (25 P.S. §§ 2649 and 2870).

EL-7 Challenge Affidavits

Consists of challenge affidavit of elector declaring eligibility to vote and supporting affidavit by another qualified elector of the district. Contains names, addresses, date and signatures of elector and supporting elector. Also signed by judge of elections.

Retain 11 months. (25 P.S. §§ 2649 and 3050(d)).

EL-8 County Board Canvass Workpapers

Preliminary tally compiled by the county board of elections showing candidates' names and vote totals.

Retain 11 months. (25 P.S. §§ 2649 and 3068).

EL-9 Election Certification Affidavits

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Election Assessment

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Sent after the certification of the returns of any primary or election to the Department of State, Bureau of Elections. The form includes name of county, date, certification of official returns, signatures of county board and clerk of elections, and vote totals for each candidate.

Retain 11 months. (Counties). (25 P.S. §§ 2649 and 3158).

EL-10 Election Documents - Miscellaneous

Contains records pertaining to each election such as proof of publication forms and acceptance statements.

Retain 11 months. (Counties). (25 P.S. § 2649).

EL-11 Election Officers' Oaths

Consists of sworn statements signed by election officers including judges, inspectors, clerks, machine inspectors and overseers. Excludes oaths contained in ballot box.

Retain 11 months. (25 P.S. §§ 2649 and 2676 - 2680).

EL-12 Election Officials Index

Listing of district election board members showing names and terms of office.

Retain 11 months. (25 P.S. § 2649).

EL-13 Election Returns

Compiled by county board for general, municipal and primary elections. Returns generally indicate district number, office, candidates' names and party affiliations, votes received, certification of computation attesting to authenticity of vote, signatures of election officials and date. Also may contain results relating to special referendums and questions.

Retain permanently for administrative and historical purposes. (25 P.S. § 3158).

EL-14 Fiscal Records

Includes standard accounting and financial records relating to the funds of the Elections Office.

Fulton County Pennsylvania
Election Assessment

See Financial Records, Payroll Records, and **Purchasing Records** found in Section 2 for retention guidance.

EL-15 General Return Sheets

Prepared by district board, return shows number of votes cast for each candidate; total number of ballots received and cast, declared void, spoiled, cancelled and blank; signatures of election officers and clerks; and certification by overseers if applicable.

Retain 11 months. (25 P.S. §§ 2649 and 3154).

EL-16 Legal Memoranda

Includes legal memoranda respecting a variety of legal issues and matters relating to county elections.

Retain 11 months. (25 P.S. § 2649).

EL-17 Minutes Of The Board Of Elections

Record of the Board of Elections meeting including date, names of members present and absent, issues discussed, motions, reports and actions taken.

Retain permanently for administrative, legal and historical purposes.

EL-18 Local Option Petitions

Petition regarding local option question to be placed on the ballot. Shows issue or question and electors' signatures and addresses.

Retain 2 years. (25 P.S. § 2943).

EL-19 Nomination Certificates

Used to fill vacancies caused by death or withdrawal of candidate, certificate shows office and district, cause of vacancy, applicable rule, names of committee or caucus members as well as new candidate's name, residence and occupation. Signed by presiding officer and secretary of party committee or members of political body's committee.

Retain 2 years. (25 P.S. §§ 2943 and 2939(a)).

EL-20 Nomination Papers

Fulton County Pennsylvania
Election Assessment

Relating to nomination of independent candidates, paper usually indicates name of political body; county and electoral district; candidate's name, occupation, residence as well as office and district for which nominated; names of committee members authorized to fill vacancies; electors' signatures, addresses, occupations and date of signing; circulator's affidavit; and candidate's affidavit, loyalty oath and ethics affidavit.

Retain 2 years. (25 P.S. §§ 2943 and 2911(a)).

EL-21 Nomination Petitions

Usually shows electoral district and political party; candidate's name, address, and profession; election date and office sought; signatures, addresses and occupations of qualified electors and date of signing; circulator's affidavit; and sometimes candidate's affidavit, loyalty oath and ethics affidavit.

Retain 2 years. (25 P.S. §§ 2943 and 2867).

EL-22 Notices Of Nominations To Be Made

Used to assist county board in ascertaining offices to be filled, notices from municipalities and the Secretary of the Commonwealth; usually indicate name of office, number of candidates to be elected and number of years the officer shall serve.

Retain 11 months. (25 P.S. §§ 2649, 2864 and 2865).

EL-23 Numbered Lists Of Voters

Numerical list of voters used to determine the number who cast ballots in election. Excludes lists contained in ballot box.

Retain 11 months. (25 P.S. §§ 2649 and 3050(a.3)).

EL-24 Official Ballots

Consists of paper ballots and ballot labels used with voting machines and electronic voting equipment. Includes the following types of ballots:

(1) Electronic and punch card write-in ballots.
(2) Official ballot cards-punch card system.
(3) Mechanical voting machine write-in paper rolls.
(4) Spoiled and unused ballot cards-punch card system.
(5) Spoiled and unused paper ballots.

Fulton County Pennsylvania
Election Assessment

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Retain 4 months for all official ballots and the contents of ballot boxes, unless notified by the county's district attorney or a judge of a court of record that an extension of retention is required due to pending prosecution or litigation. (25 P.S. §§ 2649, 3031.13(a), 3031.16(a), 3063(a) and 3065(a)).

EL-25 Primary Ballot Position Lottery Workpapers

Used to draw lots for ballot position for primary elections. Papers relate to local candidates and usually include name, party and office sought.

Retain 11 months. (25 P.S. §§ 2649 and 2875).

EL-26 Proclamations Of Elections

Issued by county board. Usually lists date of election, offices and candidates, special referendums or questions, and locations of polling places.

Retain 11 months. (25 P.S. §§ 2649 and 3041).

EL-27 Records Of Assisted Voters

Compiled at polling place. Record indicates municipality, ward and district; date of election; name of voter and reason for assistance; name of person furnishing assistance; and signature of judge of election.

Retain 11 months. (25 P.S. §§ 2649 and 3058).

EL-28 Secretary Of The Commonwealth Ballot Certifications

Includes certifications of Statewide candidates' names to be printed on ballots for the primary and general elections. Sent to county boards by the Secretary and based upon a lottery conducted in Harrisburg.

Retain 11 months for counties. (25 P.S. §§ 2649 and 2876).

EL-29 Specimen Ballots, Specimen Ballot Labels And/Or Voting Machine Diagrams

Contains sample ballots and voting machine diagrams made available to candidates for campaigning purposes and to electors at polling places.

Retain 11 months. (25 P.S. §§ 2649 and 2968).

EL-30 Statements Of Financial Interests

Fulton County Pennsylvania
Election Assessment

Required by the State Ethics Commission. Shows name and address, office sought, occupation, names and occupations of spouse and minor dependent children, financial disclosure information and signature.

Retain 5 years. (65 Pa.C.S.A. § 1107(9)).

EL-31 Tally Papers

Prepared by district board, consists of tally of votes cast for each candidate. Excludes papers contained in ballot box.

Retain 11 months. (25 P.S. §§ 2649 and 3062).

EL-32 Voters' Certificates/Voting Check Lists

A few counties continue to use a separate Voter's Certificate, which is completed by a voter at the polling place. (However, most county boards of elections have incorporated the Voter's Certificate into the District Register (Poll Book), which must be kept for 5 years and is also addressed at Voter Registration Records entry # VR-8.) The Voters' Certificate, at 25 P.S. § 3043, is a form usually indicating at least the voter's name, address, signature and approval of an election officer. The Voters' Certificate is required by 25 P.S. § 3052 to be inserted into a binder known as the "Voting Check List," which shall constitute the official list of electors voting at each primary and election. 25 P.S. § 3050(a.3) requires the voter's signature on the Voter's Certificate to be compared with the voter's signature in the District Register to confirm eligibility to vote. With the passage of Act 3 of 2002, the District Register is required to be retained for 5 years at 25 Pa.C.S. § 1405(a). Because the Voter's Certificate is signed by the voter and is used in conjunction with the District Register, it should be retained for 5 years as well.

Retain 5 years. (25 P.S. §§ 3043, 3050(a) and (a.3), 3052 and 25 Pa.C.S. § 1405(a)).

EL-33 Voting Machine Lists And Certifications

Consists of inventory lists showing number of machines, storage locations and registration numbers. Certification form relates to preparation of machines for election and includes custodian's certification that counter is set at zero, that each protective counter has been recorded, and that each machine has been sealed and the seal number recorded. Also shows election, date, and signatures of custodian and deputies.

Retain 11 months. (25 P.S. §§ 2649 and 3011(d)).

EL-34 Voting Machine Proof Sheets

Fulton County Pennsylvania
Election Assessment

Relates to voting machines equipped to print paper proof sheets. Printed by district board before and after election and used to check vote totals on each machine.

Retain 11 months. (25 P.S. §§ 2649 and 3067(a)).

Speckin Forensics, LLC

120 N. WASHINGTON SQUARE, SUITE 300
PMB 5068
LANSING, MICHIGAN 48933
517-349-3528 · FAX 954-839-8219

PLEASE DIRECT CORRESPONDENCE & PAYMENT HERE:
2450 HOLLYWOOD BOULEVARD, SUITE 700
HOLLYWOOD, FLORIDA 33020
954-763-8134 · FAX 954-839-8219

www.4N6.com

LEONARD A. SPECKIN
RETIRED DOCUMENT ANALYST

MICHAEL J. SINKE
RETIRED LATENT PRINT SPECIALIST
RETIRED CRIME SCENE RECONSTRUCTION
RETIRED FORENSIC DOCUMENT ANALYST

DR. GEORGE F. JACKSON Ph.D.
FORENSIC TOXICOLOGIST

ERICH J. SPECKIN
FORENSIC DOCUMENT ANALYST
INK DATING SPECIALIST

PHILLIP MATUSIAK
COMPUTER & GRAPHICS SPECIALIST

THOMAS K. HUARD Ph.D.
DNA ANALYST & CONSULTANT

MARSHAUN BLAKE
ARSON & FIRE SPECIALIST

ANTHONY A. MILONE
COMPUTER & GRAPHICS SPECIALIST
FORENSIC DOCUMENT SPECIALIST

DR. JULIE HOWENSTINE
SEROLOGIST
DNA ANALYST & CONSULTANT
CRIME SCENE RECONSTRUCTION

September 15, 2022

Speckin Forensics was retained to acquire forensic Images of hard drives in Fulton County, Pennsylvania. The images of the drives that are the subject of this report were created on July 13-14, 2022.

A total of six hard drives were tendered for copying and analysis. The hard drives were in the corresponding device and were removed for copying and analysis. The record of the drive and the corresponding machine was recorded. One of the hard drives was not operable at the time of our imaging and therefore was not copied. This can be attempted at a later time with a more time-consuming procedure but has not yet been attempted. The remaining five drives were copied during the time onsite in Pennsylvania. The forensic image of each drive was saved on its own new unused Western Digital 4TB USB hard drive. This allowed for later duplication and examination of the evidence.

Using forensically sound procedures we documented the service tag numbers for all machines and the serial numbers of the corresponding hard drives contained within. Photographs were taken to record this. The drives copied are labeled as follows:

	Service Tag	Computer Name	Serial Number	Machine Model
1	3095PY2	EMSSERVER	59PUPSi1T/ 59PUPSi0T	Dell Precision 3430
3	1FPLNY2	Adjudication01	59OUPRS2T	Dell OptiPlex 3050
4	1FNPHY2	Failed drive	59OUPRRRT	Dell OptiPlex 3050
5	30C4PY2	EMSCLIENT02	59PUPSHNT	Dell Precision 3430
6	30B4PY2	EMSCLIENT01	59PUPSI5T	Dell Precision 3430

The key findings are summarized below:

1. The security measures necessary to harden and secure the machines was not completed. The last update or security patch to the devices shows to be April 10, 2019, and no patches or updates were performed after this date.

2. External USB drives have been inserted on several occasions. We are unaware of any current list of approved external drives that could have been used. Therefore, there is no way to determine if any of the inserted USB drives was from an unauthorized source or if the USB drive further comprised the data or the system.

3. There have been substantial changes to the drives as seen with the inclusion of over 900 .dll files and links created since the date of installation of the Dominion software. This .dll additional pathway is a security breach because of the introduction of an unauthorized script.

4. There have also been no updates to the usernames or passwords as the passwords use default settings like "admin" and "guest". The group policies of the devices remain at default settings which in simple terms allows the username "admin" with password "admin"; complete access to the device.

5. The Adjudication01 workstation has a python script installed after the certification date of the system.   This should not be added to the drive after a system has already been certified. This python script can exploit and create any number of vulnerabilities including, external access to the system, data export of the tabulations, or introduction of other metrics not part of or allowed by the certification process.

6. As expected and normal, each of the drives are interconnected in a system to one another. This would be required to provide sharing of data and counts between devices. Because of this networking, unauthorized access any one device, allows unauthorized access to any device connected to the network of devices.

7. An external IP address that is associated with Canada is found on the Adjudication 01. This shows that at least one of the network devices has connected to an external device on an external network. This is the same device that the post certification python script is found.

Procedure:

The hard drives from the computers were removed and connected them to a Forensic workstation. The hard drives were mounted as READ ONLY. Using FTK Imager a bit for bit copy was created using the Expert Witness file format. This is an industry standard format for storing forensic images. During the image creation process a hash value was computed to ensure the integrity of evidence. One of the main uses of hash values is to determine the integrity of data.

The copied data was analyzed using standard computer forensic software generally accepted in the field to search for the elements contained in this report.

Results:

Windows defender was found on the machines which dates to July 2016. No updates have been made since this time. Simply stated this means that viruses or malicious software components created after that date would not be combatted by this protection without the updates.

Further, Dominion published hardening procedures in 2019 that would reduce the chance of the system being compromised and provide additional security measures for the integrity of the system.

Below is a chart that shows external drives that have been connected to the devices examined.

The Dominion voting Systems software was installed on the devices on 04/10/19, 8/16/19 and 8/23/19. This last install date is consistent with the drives Generic, Canyon, and ScanDisk listed below. However, the 2021 drives do not fit this pattern and are unexplained at this point.

Computer Name	Device	Last Connection Date	Connection Time
3095PY2	PNY USB 2.0 Drive	2019-07-31	16:11
3095PY2	Generic USB Flash Drive	2019-08-23	16:54
3095PY2	Canyon USB Drive	2019-08-23	18:07
3095PY2	ScanDisk Cruzer FIT	2019-08-23	18:15
3095PY2	Samsung Flash Drive	2021-04-22	13:49
3095PY2	Kingston Data Traveler	2021-05-03	20:27
1FPLNY2	Samsung Flash Drive	2021-04-30	19:27
1FPLNY2	Kingston Data Traveler	2021-05-05	13:22

The following chart shows a small sample of .dll activity after the installation date of the voting software.

Name	Deleted	Last Accessed	File Created	Last Written	Entry Modified
UIAutomationTypes.ni.dll	•	08/29/19 08:02:12AM	08/29/19 08:02:12AM	08/29/19 08:02:12AM	10/02/19 04:44:27AM
System.Management.ni.dll		08/29/19 08:02:13AM	08/29/19 08:02:13AM	08/29/19 08:02:13AM	05/18/20 06:50:50AM
UIAutomationProvider.ni.dll	•	08/29/19 08:02:13AM	08/29/19 08:02:13AM	08/29/19 08:02:13AM	10/02/19 04:44:27AM
System.Drawing.ni.dll		08/29/19 08:02:15AM	08/29/19 08:02:15AM	08/29/19 08:02:15AM	10/02/19 04:44:24AM
System.Windows.Forms.ni.dll		08/29/19 08:02:19AM	08/29/19 08:02:19AM	08/29/19 08:02:19AM	10/02/19 04:44:26AM
System.Web.ni.dll		08/29/19 08:02:31AM	08/29/19 08:02:31AM	08/29/19 08:02:32AM	10/17/19 05:55:54AM
System.Messaging.ni.dll		08/29/19 08:02:33AM	08/29/19 08:02:33AM	08/29/19 08:02:33AM	10/17/19 05:55:53AM
System.EnterpriseServices.ni.dll		08/29/19 08:02:34AM	08/29/19 08:02:34AM	08/29/19 08:02:34AM	10/17/19 05:55:52AM

At least six different user and administrator accounts on the devices still have the password "Dvscorp2018!!!". This is the default password for the software at the time of installation. It has never been updated nor was it set to expire as should be the case. This is a glaring issue as this is specifically addressed by the Pennsylvania Secretary of State and referencing NIST.

"All jurisdictions implementing the Democracy Suite 5.5x must ensure that no default passwords are used on any devices and that all passwords are complex and secured. Counties must implement an audit process to review and ensure that no default passwords are used upon equipment install/reinstall and routinely change passwords to avoid any password compromise. The passwords and permissions management must at a minimum comply to the password requirements outlined in NIST 800-63".

The log files for the Adjudication device shows an IP address, 172.102.16.22. This IP address comes back to a location in Quebec, Canada, this is a serious issue to be connected remotely to a Canadian system. We cannot determine when this connection occurred or what data was transmitted, but an external connection was made at some point.

🐞 fulton Co · Autopsy 4.19.3

Case View Tools Window Help

Add Data Source Images/Videos Communications Geolocation Timeline Discovery

← ·

- 177.95 94.79 (1)
- 107.99.33 44.7.)
- 151.85.135.145 (3)
- 111.96.215.145 (2)
- 157.85.96.146 (3)
- 157.95.45.5 (1)
- 177.98.40.5 (1)
- 409.96.04.411 (1)
- 317.95.42.41 (2)
- 157.99.156.1 (1)
- 147.99.135.33 (1)
- 157.99.244.1 (1)
- 157.98.244.141 (1)
- 157.95.5.1 (2)
- 45.4.48.49
- 44.6.49.6 (2)
- 85.1.9.145 (1)
- 46.3.6.3 (2)
- 46.225.4.4 (5)
- 46.4.1.47 (2)
- 149.254.4.6 (4)
- 346.144.4.1 (1)
- 456.13-1.156.9 (1)
- 547.264.253.254 (1)
- 547.254.256.256 (1)
- 346.59.3.141 (1)
- 172.8.4.0 (1)
- 17.19.4.9 (4)
- 17.1.9.4.20.1)

- ... 4.1.19.194 (2)
- 172.16.4.3 (4)
- 172.16.105.216 (1)
- 46.4.1.1 (2)
- 46.4.2.1 (1)
- 46.4.205 (9)
- 46.1.1.1 (1)
- 46.4.6.46.2 (1)
- 46.44.4 (1)
- 46.4.6.26.2 (1)
- 46.1.2.6 (1)
- 47.2.6.194 (6)
- 46.44.171 (9)

Donald A. Smith

Computer Data Specialist

EXHIBIT F

UNITED STATES ELECTION ASSISTANCE COMMISSION (EAC) REPORT OF INVESTIGATION OF DOMINION VOTING SYSTEMS,

MARCH 31, 2022

United States Election Assistance Commission
Report of Investigation

Dominion Voting Systems D-Suite 5.5-B
Williamson County, Tennessee

March 31, 2022

Jonathon Panek
Director, Voting System Testing and Certification

U.S. ELECTION ASSISTANCE COMMISSION
633 3rd St. NW, Suite 200
Washington, DC 20001

Contents

U.S. ELECTION ASSISTANCE COMMISSION
633 3rd St. NW, Suite 200
Washington, DC 20001

Introduction

In late 2002, Congress passed the Help America Vote Act of 2002 (HAVA), which created the U.S. Election Assistance Commission (EAC) and vested it with the responsibility of setting voting system standards and providing for the testing and certification of voting systems. This mandate represented the first time the Federal government provided for the voluntary testing, certification, and decertification of voting systems nationwide. In response to this HAVA requirement, the EAC has developed the Federal Voting System Testing and Certification Program.

The EAC's Testing and Certification Program includes several quality monitoring tools that help ensure that voting systems continue to meet the EAC's voting system standards as the systems are manufactured, delivered, and used in Federal elections. These aspects of the program enable the EAC to independently monitor the continued compliance of fielded voting systems. One of these tools is field anomaly reporting.

Election officials may submit notices of voting system anomalies directly to the EAC. An anomaly is defined as an irregular or inconsistent action or response from the voting system, or system component, which resulted in the system or component not functioning as intended or expected. Anomaly reports may indicate a voting system is not in compliance with the Voluntary Voting System Guidelines or the procedural requirements of this EAC Testing and Certification Program.

An informal inquiry is the first step taken when information of this nature is presented to the EAC. The sole purpose of the informal inquiry is to determine whether a formal investigation is warranted. The outcome of an informal inquiry is limited to a decision on referral for investigation. A formal investigation is an official investigation by the EAC to determine whether a voting system warrants decertification. The result of a formal investigation is a Report of Investigation.

Reported Anomaly

On November 3, 2021, the EAC received a report from the Tennessee Secretary of State's (TN SoS) office that they were planning an investigation into an anomaly observed in Williamson County, Tennessee during a municipal election held on October 26, 2021, regarding Dominion D-Suite 5.5-B ImageCast Precinct (ICP) tabulators. Close poll reports from 7 of the 18 ICP tabulators used during the election did not match the number of ballots scanned. Subsequent tabulation on the jurisdiction's ICC central count scanner provided the correct tally. The central count tabulation was confirmed via hand count of the paper ballot records on October 27, 2021.

Discussions with the TN SoS on December 17, 2021, and January 5, 2022, following their investigation, provided additional details to the EAC. The details of the anomaly were

US Election Assistance Commission
Report of Investigation

U.S. ELECTION ASSISTANCE COMMISSION
633 3rd St. NW, Suite 200
Washington, DC 20001

confirmed and reproduced during the state investigation, though the root cause of the anomaly was not determined.

Formal Investigation

Based upon the information obtained from the TN SoS, the EAC initiated a formal investigation into the matter to determine the necessary actions to obtain the root cause and remedy the issue. The investigation was conducted at the Williamson County Elections Commission facility on January 19 through January 22, 2022. This analysis was performed by both EAC accredited Voting System Test Laboratories (VSTL), Pro V&V and SLI Compliance. The EAC, Williamson County staff, TN SoS, and Dominion staff were present during the analysis.

Testing and Analysis

The first step of the VSTL analysis was verification of the system configuration. Hashes of all components involved were collected and compared to the repository of hashes for the EAC certified system. It was discovered that the system was installed with outdated versions of two configuration files when the system was upgraded from D-Suite 5.5 to D-Suite 5.5-B in January of 2021.

Next, a copy of the election definition used on election day was used to make Compact Flash (CF) cards for the ImageCast Precinct (ICP) scanners and ImageCast X (ICX) ballot marking devices. This election definition was imported into the D-Suite 5.5-B system from a definition originally created on the D-Suite 5.5 system.

Ballots were printed from the ICX and tabulated through the ICP scanners. Multiple ICP scanners were used for tabulation including some that originally exhibited the anomaly during the election and some that did not. Following tabulation, close poll reports and audit logs from the ICP scanners were examined. Results showed that the anomaly was recreated on each of the ICP scanners. This process was repeated several times to understand and isolate the details of exactly when the anomaly occurred and circumstances that may have led to the anomaly occurring.

Analysis of audit log information revealed entries that coincided with the manifestation of the anomaly; a security error "QR code signature mismatch" and a warning message "Ballot format or id is unrecognizable" indicating a QR code misread occurred. When these events were logged, the ballot was rejected. Subsequent resetting of the ICP scanners and additional tabulation demonstrated that each instance of the anomaly coincided with the previously mentioned audit log entries, though not every instance of those audit log entries resulted in the anomaly.

Further analysis of the anomaly behavior showed that the scanners correctly tabulated all ballots until the anomaly was triggered. Following the anomaly, ballots successfully scanned

US Election Assistance Commission
Report of Investigation

U.S. ELECTION ASSISTANCE COMMISSION
633 3rd St. NW, Suite 200
Washington, DC 20001

and tabulated by the ICP were not reflected in the close poll reports on the affected ICP scanners.

Additional iterations of testing were performed after updating the configuration files previously mentioned to the proper versions associated with the D-Suite 5.5-B system. The anomaly was recreated using the correct configuration files with the originally programmed election definition.

A final test was performed using an election definition recreated entirely on the D-Suite 5.5-B system with identical parameters to the definition used during the election and for prior testing. The anomaly was not observed during this test, and there were no instances of the security error "QR code signature mismatch" or warning message "Ballot format or id is unrecognizable" in the audit log.

Conclusion of Formal Investigation

The direct cause of the anomaly was inconclusive. Based on the investigation, it's reasonable to conclude that the anomaly is related to the imported D-Suite 5.5 election definition used on the D-Suite 5.5-B system.

On February 11, 2022, Dominion submitted a Root Cause Analysis (RCA) to the EAC. The report indicates that erroneous code is present in the EAC certified D-Suite 5.5-B and D-Suite 5.5-C systems. The RCA report states that when the anomaly occurs, it's due to a misread of the QR code. If the QR code misread affects a certain part of the QR code, the ICP scanner mistakenly interprets a bit in the code that marks the ballot as provisional. Once that misread happens, the provisional flag is not properly reset after that ballot's voting session. The result is that every ballot scanned and tabulated by the machine after that misread is marked as provisional and thus, not included in the tabulator's close poll report totals.

Dominion has submitted Engineering Change Orders (ECO)s for the ICP software in the D-Suite 5.5-B and D-Suite 5.5-C systems: ECO 100826 and ECO 100827. Modified ICP source code was submitted by Dominion that resets the provisional flag following each voting session. The ECO analysis included source code review to confirm the change to both systems and to ensure no other code is changed. A Trusted Build of the modified source code was performed to produce the updated ICP software. This software was then tested for accuracy by processing two thousand ballots printed by an ICX, utilizing the same election definition used in Williamson County, TN on October 26, 2021.

The analysis and testing of the ECOs has demonstrated that the anomaly was successfully fixed. No instance of the anomaly or the associated error or warning messages in the ICP audit logs were observed during the testing. The EAC has approved ECO 100826 and ECO 100827 on March 31, 2022.